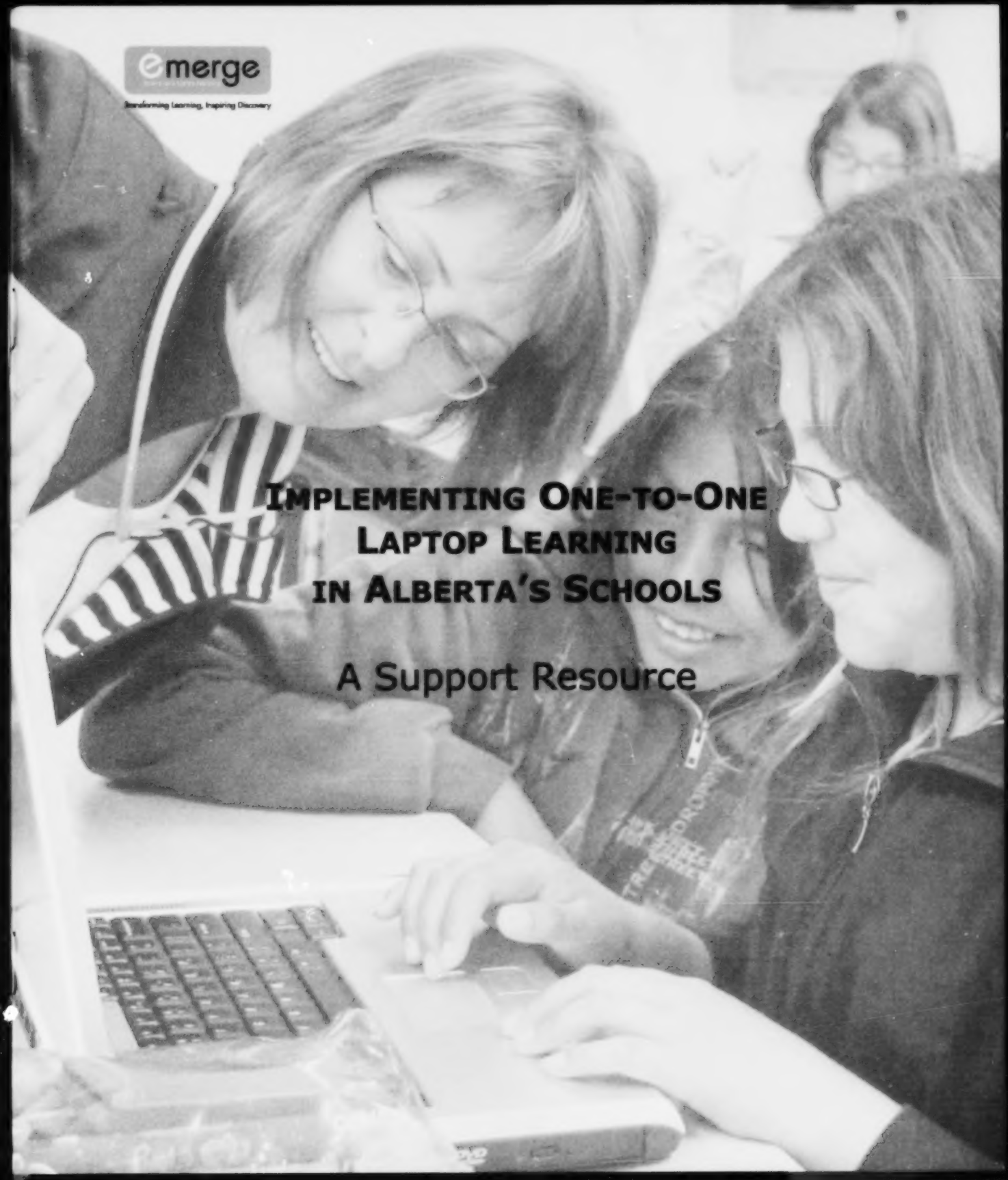

emerge

Transforming Learning, Inspiring Discovery

Implementing One-to-One Laptop Learning in Alberta's Schools

A Support Resource

Alberta

Freedom To Create. Spirit To Achieve.

Government of Alberta

Implementing One-to-One Laptop Learning in Alberta's Schools: A Support Resource.

This document is available on the Internet at: http://www.education.alberta.ca/admin/technology/emerge-one-to-one.aspx.

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A Support Resource

Research continues to support the many teaching and learning benefits of one-to-one laptop learning. Benefits range from improved student engagement and teacher-student interactions to the attainment of 21st century skills and the transformation of teacher practice. Additional benefits include improved student writing skills, increased teacher enthusiasm and retention as well as increased parental and community involvement (Alberta Education, 2006).[i]

Successfully implementing one-to-one laptop learning is, however, a complex and challenging undertaking. Several authors have compiled the lessons that educators have learned from their implementation experiences (Alberta Education, 2006; Livingston, 2006; Zucker, 2005).[ii] These compilations, although valuable, have not captured the lessons learned by educators in Alberta who are currently implementing one-to-one laptop learning through the *Emerge One-to-One Laptop Learning Project* (2006-2010).[iii]

This document captures the collective wisdom of *Emerge Project* participants. The lessons they have learned are described in terms of promising practices in the following areas:

- Visionary leadership and sustained innovation.
- Thoughtful and systematic planning and management.
- Continuous professional development.
- Sufficient technology, infrastructure and technical supports.
- Ongoing assessment and evaluation.
- Involved parents and communities.

As such, this support resource is intended to help educators successfully implement one-to-one laptop learning in Alberta's schools.

This resource is intended to help educators successfully implement one-to-one mobile computing in Alberta's schools.

Overall Aims and Objectives

The *Emerge One-to-One Laptop Learning Project*[iv] was initiated in 2006 by Alberta Education in response to a growing trend toward one-to-one laptop learning. This research-based initiative involves over 2500 students and approximately 170 teachers in 49 schools across 20 school jurisdictions in Alberta. Each of the twenty projects aims to

- enhance teaching and learning for specific student populations and/or
- improve student learning in targeted areas.

The Emerge Projects aim to

- ***enhance teaching and learning for specific student populations and/or***
- ***improve student learning in targeted areas.***

See *Appendix B: Emerge Project – Participating Jurisdictions* for more detailed project descriptions of each project.

The overall objectives of the *Emerge Project* are as follows:

- To investigate the potential educational benefits of one-to-one laptop learning;
- To identify technical merits and innovative practices in one-to-one laptop learning;
- To share expertise, experience and lessons learned related to one-to-one laptop learning; and
- To inform and support one-to-one laptop learning implementations within Alberta's learning system.

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A community of practice meets regularly to share knowledge and practices, find solutions, and build innovations. More information about the community of practice, including goals, activities, resources, articles, news, surveys and contacts can be found at http://www.1to1alberta.ca/.

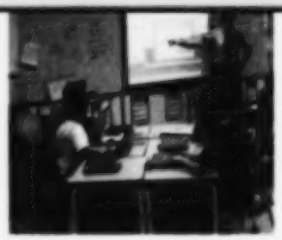
The *Emerge Project* is scheduled to be completed in August 2010 with final research results published soon thereafter. An educational summit will be held in August 2010 where participants from around the world will share research, lessons learned and best practices about one-to-one laptop learning.

One-to-One Laptop Learning Environments Described

One-to-one laptop learning environments differ somewhat from school to school but essentially these environments provide each teacher and student with

- anytime, anywhere access to a computing device (e.g., laptop, notebook or tablet PC); as well as
- several tools and resources (e.g., productivity software, assistive technologies, online learning resources and tools (e.g., LearnAlberta.ca, Intelligence Online), rubrics and collaboration tools and environments).

One-to-one mobile computing environments are often characterized as personalized, that is, teaching and learning is inquiry based, collaborative, and focused on student needs and interests.



While at school, the computing devices are connected to a local area network and the Internet via a wireless connection. Connectivity to the Internet in the home varies from one school community to another.

One-to-one laptop learning environments are also often characterized as personalized. Personalized teaching and learning environments

- are engaging, rigorous, relevant, and student-focused;
- provide students with opportunities to address complex issues, problems and questions by collaborating with others to build knowledge, and develop skills and attributes within and across subject areas;
- are differentiated, supporting students' diverse learning needs and interests;
- employ various technologies, digital tools and resources; and
- are flexible and extend beyond the classroom.

A local example of this type of personalized teaching and learning environment is described in *Appendix A: Emerge Project Case Studies: Case Study 1: Hardisty Junior High School – Edmonton Public Schools*. In this case study, we learn how Kate, a special needs student, is gaining confidence, collaborating with her peers, learning more independently and developing organizational skills. Her successes are attributed to a rich one-to-one laptop learning experience, with exposure to differentiated instructional strategies and a variety of technologies.

Additional case studies are offered in *Appendix A* that describe how one-to-one laptop learning is

- benefiting Aboriginal learners, at-risk learners, and remote communities;
- enhancing literacy and the development of 21 century skills; and
- creating collaborative learning communities.

Site-based Goals

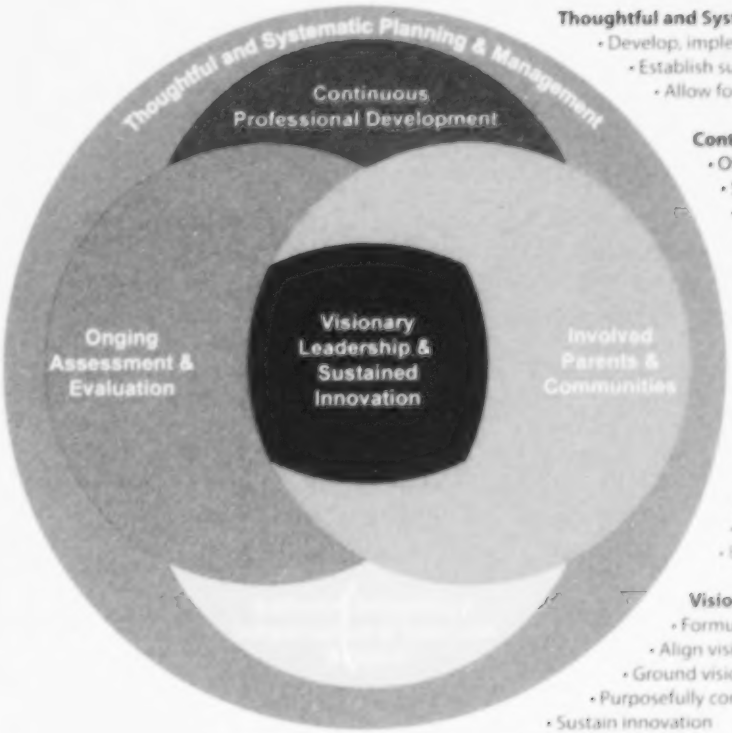
Each *Emerge Project* site is striving to attain goals specific to their unique contexts. Participants' collective goals, many of which evolved over time, may include some or all of the following:

- to improve the attainment by students of 21st century skills in three key areas (i.e., critical thinking, teaming and collaboration, and self-directed learning);
- to build a foundation based on the concept of digital citizenship;[v]
- to improve student learning in other areas including inquiry-based learning, reading and writing skills, digital literacy, inventive thinking, problem solving, and communication and presentation skills;
- to improve student engagement and achievement (specifically in core subject areas such as English language arts, mathematics, science and social studies) through universal design for learning and by involving students in authentic learning using a variety of technologies (e.g., laptop learning devices, videoconferencing, assistive technologies);
- to improve students' French language competencies and to explore the benefits of connecting with the Francophone community and others through the use of laptop learning in school, at home and in the community;
- to engage students in self-directed learning through the use of differentiated instruction;
- to re-engage at-risk students in learning through digital content and resources;
- to meet the diverse needs of junior high students in multi-age classrooms in low-population rural communities;
- to explore assessment for learning strategies;
- to investigate the benefits of using assistive technologies to enhance teaching and learning among students with diverse learning needs with a focus on English as a second language, and First Nations, Métis and Inuit (FNMI) learners;
- to foster a model of cooperation and collaboration within an environment that promotes sustainability;
- to promote communication and the use of online collaboration tools.[vi]

Promising Practices Overview

Much has been learned by *Emerge Project* participants in their work to achieve their goals. A series of facilitated question and answer sessions were held with *Emerge Project* participants during the summer of 2009 to elicit reflections about the lessons they had learned during the first two years of the project. Participants included district and school level administrators, project leads, technical personnel, educators, researchers, and departmental staff. Their compiled reflections were analyzed and can best be described in terms of six related areas of promising practice for the implementation of one-to-one laptop learning (see Diagram 1 below).

Diagram 1: Promising Practices Overview


Thoughtful and Systematic Planning & Management
Continuous Professional Development
Onging Assessment & Evaluation
Visionary Leadership & Sustained Innovation
Involved Parents & Communities

Thoughtful and Systematic Planning & Management
- Develop, implement, review, revise and communicate plans
- Establish supportive policies, protocols and procedures
- Allow for adaptability and flexibility

Continuous Professional Development
- Offer targeted professional learning opportunities
- Schedule time for collaboration
- Monitor effectiveness of professional development on teacher practice

Involved Parents & Communities
- Communicate and collaborate
- Proactively address issues
- Showcase/celebrate successes

Sufficient Technology, Infrastructure & Technical Support
- Plan technical support to facilitate teaching and learning
- Monitor effectiveness and efficiency of technical support
- Involve training personnel in technical support

Ongoing Assessment & Evaluation
- Clarify expectations
- Employ various measures and methods

Visionary Leadership & Sustained Innovation
- Formulate a vision with input from multiple stakeholders
- Align vision with local priorities
- Ground vision in best practice
- Purposefully communicate vision
- Sustain innovation

Essential Components for Effectively Leveraging Technology for Learning

The promising practices described by *Emerge Project* participants align closely with the essential components for effectively leveraging technology for learning put forward by the International Society for Technology in Education (ISTE)[vii] and adapted by Alberta Education for use as a framework for the implementation of one-to-one laptop learning. For example, components such as shared vision, professional development, community involvement, technical support and assessment and evaluation are considered essential to success. See *Appendix C: Framework for Essential Components* for a fuller description of each essential component.

The following six sub-sections of this resource describe the detailed promising practices shared by *Emerge Project* participants in the areas of

1. Visionary leadership and sustained innovation;
2. Thoughtful and systematic planning and management;
3. Continuous professional development;
4. Sufficient technology, infrastructure and technical support;
5. Ongoing assessment and evaluation; and
6. Involved parents and communities.

Important Note: These promising practices are not intended to prescribe a specific implementation approach, rather it is hoped that those interested in implementing one-to-one laptop learning will consider them within the unique contexts of their jurisdiction and/or school.

TIPS & TOOLS

Tips and tools are interspersed throughout the promising practices. Look for this symbol for helpful information and resources to support the effective implementation of one-to-one mobile computing.

Visionary Leadership and Sustained Innovation

Visionary leaders are instrumental in sustaining innovation. They seek input from multiple stakeholders in the formulation of a vision, and ensure that the vision aligns with local priorities, is grounded in best practice, and is purposefully communicated.

Emerge Project participants concur that to sustain innovative one-to-one laptop learning environments, it is important for leaders at every level within the jurisdiction, school, classroom, home and community to collaborate to

- formulate a vision with input from multiple stakeholders,
- align that vision with local priorities,
- ground that vision in best practice, and
- purposefully communicate that vision.

Participants' specific recommendations in each of these areas are provided below.

Formulate vision with input from multiple stakeholders

- Use an inclusive process to develop the vision by involving all stakeholders who will be impacted by the one-to-one laptop learning program. Grassroots input is important. For example, involve teachers, principals, parents, students, curriculum coordinators/directors, educational technology coordinators/directors, district office personnel, vendors and community members from the outset.
- Allow sufficient time to develop the vision.
- Develop a culture of collaboration.
- Facilitate shared decision making.
- Avoid teacher isolation and organizational silos.

Align vision with local priorities

- Ensure the vision is a jurisdictional priority. Blend emergent ideas from several school-developed visions, then review and revise the vision annually as needed.
- Align vision with accountability pillars, school and district priorities, 3-year education plans, classroom goals, community needs, the needs of 21st century learners, and complementary projects (e.g., videoconferencing, Alberta Initiative for School Improvement (AISI), Innovative Classroom Technology Initiative, focus on inquiry projects).
- Address concerns related to continuity of one-to-one access when students transition from a specific grade or school where one-to-one laptop learning is being offered.
- Address equity of access issues where feasible. Carefully consider the implications of access to wireless computing for some versus all within a school and/or jurisdiction (that includes teachers and administrators as well as students).

In general, *Emerge Project* participants advise that although it is simpler to start small when implementing one-to-one laptop learning, there are benefits to involving the whole school wherever possible. On the other hand, some participants realized success when only one classroom in a school received laptops. They saw excitement and motivation build from the experiences within this initial classroom.

Emerge Project participants are using a variety of models to address equity of access issues. For example schools are

- providing students in some grades (e.g., grades 5-9) with one-to-one access while students in other grades (e.g., grades K-4) are using mobile laptop carts in an effort to decrease the student to computer ratio;
- considering or already allowing the use of personally-owned devices (i.e., teacher- and/or student-owned laptops or other digital devices);
- implementing various user payment plans to stretch the dollars available for one-to-one implementation (e.g., schools are implementing a variety of parent payment plans usually totaling under $100 and payable over multiple years (3 to 5)). These fees are used to cover costs associated with equipment repairs and replacement, insurance and/or deductibles. Some schools have established a "corporate technology fund" for use when a student is unable to pay the necessary fees;
- using a lottery approach when the demand for one-to-one laptop learning exceeds the available spaces;
- giving ever-greened office laptops to students as they become available;
- repurposing older laptops as school-based kiosks;
- providing laptops for all administrators and teachers regardless of their

TIPS & TOOLS

- Metiri's *Cyclical Model* can be used to support the design and implementation of technology-based learning solutions (see *Appendix D* for more information).
- For more information about 21st century learning see *enGauge 21st Century Skills* (2003) at http://www.metiri.com/21/Metiri-NCREL21stSkills.pdf and *Learning for the 21st Century* (Pub date unknown) at http://www.21stcenturyskills.org/images/stories/otherdocs/p21up_Report.pdf as well as "21 Steps to 21st Century Learning" at http://www.aalf.org/cms/?page=AALF%20-%2021%20Steps%20to%2021st%20Century%20Learning.
- The *Collaborative Inquiry Model* can be used to help develop a culture of collaboration (see http://www.1to1alberta.ca/resources/planning/workbook.doc and *Appendix E* for more information).
- See *Appendix F: One-to-One Mobile Computing Resources* for links to research, one-to-one web sites, and more.
- The communication toolkit developed to support the *Emerge Project* can be used to support communications planning (see http://www.1to1alberta.ca/resources/reporting/CommunicationsToolkit.doc).
- The Councils on Alberta Teaching Standards offers information about distributed leadership in their Oct 2008 newsletter (see http://www.teachingquality.ab.ca/WhatsNew/2008_10.html).
- BECTA offers several resources to support technology leaders (see http://schools.becta.org.uk/index.php?section=lv and http://publications.becta.org.uk/display.cfm?resID=39131&page=1835).

involvement in the Emerge Project;
- considering less expensive devices such as iPhones and Netbooks rather than laptops as their project moves forward;
- recognizing that desktop workstations are being freed up for use by students that do not currently have one-to-one laptop access;
- providing all classrooms in project schools with access to electronic whiteboards, document and flip cameras, and data projectors to "level the playing field";
- providing the laptops for school use only rather than 24/7 access.

Ground vision in best practice

- Review research.
- Make site visits to schools that are successfully implementing one-to-one laptop learning (e.g., see Appendix B for a listing of Alberta *Emerge Project* sites).
- Talk to experts (e.g., technical, assessment, pedagogical and one-to-one deployment experts). Suggestions included representatives from Apple, Metiri Group and Anytime Anywhere Learning Foundation (http://aalf.org).
- Explore proven instructional practices related to developing 21st century skills.
- Determine level of readiness in terms of teacher confidence with technology and curricula.

Purposefully communicate vision

- Provide clarity in terms of the vision and related expectations.
- Broadly and purposefully communicate the vision among all stakeholder groups. Ensure the vision is shared when new staff come on board, and when new students and parents become involved. *Emerge Project* participants are employing a range of communication strategies as follows:
  - Encourage continued discussion about the vision using online content management systems and Web applications (e.g., Moodle forums, wikis, blogs).
  - Facilitate regular communication among all stakeholders through staff meetings, parent-teacher interviews, update letters to parents/home, reports, email, school web sites, school board presentations, professional development sessions, open houses, celebration events, school/student/project portal/website, local media outlets (radio stations and newspapers) and focus groups.

Sustain innovation

Many *Emerge Project* participants report that sustained innovation in one-to-one laptop learning requires that leaders effectively manage organizational change and ensure that sufficient technical infrastructure and professional development supports are in place to realize the necessary transformation in teaching and learning. Specific *Emerge Project* participant recommendations related to sustaining innovation include the following:

- Allow use of and develop supporting policies around staff- and student-owned devices.
- Consider use of alternate wireless devices with Internet capabilities (e.g., cell phones, personal digital assistants and portable media players).

- Advocate for continued use of one-to-one laptop learning among all students within a school and/or jurisdiction.
- Consider start-up and/or user fees for incoming students to offset costs of implementing one-to-one laptop learning including the costs associated with replacement batteries, damaged equipment and cords.
- Identify minimum infrastructure standards for one-to-one laptop learning and pursue some combination of provincial licensing, grants, annual student technology user fees, open-source agreements, tax credits for families buying digital devices for educational use and other cost reduction strategies to sustain the program.
- Buy laptops instead of desktops when ever-greening school technologies.
- Revise three-year technology/school plans to consider digital citizenship, wireless networks, personal-owned devices and/or the building a portal or repository of digital resources as appropriate.

Thoughtful and Systematic Planning and Management

Emerge Project participants agree that planning is a complex but necessary effort, the importance of which cannot be underestimated. In many cases, schools spent much of their first year planning as they went. Few schools were able to adequately prepare their teachers in advance of the roll out of the equipment. Upon reflection participants advise that more time could have been devoted upfront to plan and prepare. Specific recommendations are summarized below for the thoughtful and systematic planning and management of one-to-one laptop learning, including the need for those plans to be adaptable and flexible.

Thoughtful and systematic planning is a necessary and complex effort. Its importance cannot be underestimated. Sufficient time must be allotted to develop, implement, review, revise and communicate plans and to establish supportive policies, protocols and procedures. Adaptability and flexibility are key to the successful management of implementation plans.

Develop, implement, review, revise and communicate plans

- Allow sufficient lead time for planning and preparation. Consider year one to be a developmental year.
- Create a steering committee with representation from key stakeholders groups.
- Articulate and seek affirmation on the vision and guiding principles.
- Develop a charter (goals, objectives, outcomes) and action plan. Clearly delineate expectations (e.g., for administration, educators, technical and pedagogical support staff, students, parents, vendors and community members), required resources, risks and risk mitigation strategies and timelines.
- Broadly communicate your plans via electronic, print and face-to-face means.
- Anticipate high demands for technical support personnel, especially during the first year, even if your wireless network is already operational and laptops are in use in your school.
- Articulate ongoing regularized meeting schedules and required attendees. Frequency of meetings may range from weekly to monthly to biannually depending on the purpose and attendees. Weekly meetings among teachers and the principal as well as among teachers and technical support personnel are critical at the early stages of implementation.

- Ensure smooth technical roll-out. Provide teachers with at least 4 months lead time with the technology.
- Plan for sustainability from the outset. Several participants advised that one-to-one laptop learning should not be implemented as a project with a specified end date.
- Ensure sustainability plans are flexible to address changing priorities and emerging technologies. Participants stressed the importance of asking questions about whether the laptops should stay with the teacher or move with the student. Participants also advised that long-term impacts on student learning and teacher professional development are factors to consider when answering these questions.
- Develop and implement an ongoing communication plan as follows:
  - Establish high expectations for ongoing and regular communication among all stakeholders.
  - Delineate roles and responsibilities regarding communication.
  - Employ an effective balance of formal and informal communication.
  - Identify multiple means of communication. For example:
    - electronic (e.g., email, teacher and schools web sites / portals, wikis, social networking sites, online courseware or content management systems (e.g., Moodle, D2L), group workspaces (e.g., GoogleDocs), videoconferencing);
    - print (letters to parents, school and/or division newsletters, community newspapers, divisional reports, postings of student work on school/classroom walls; and
    - face-to-face discussions (e.g., meetings, professional development sessions, school/project celebrations, open houses, web pages, town halls, update sessions at district level,

TIPS & TOOLS

- *Pieces of the Pie: You Need All of Them! Effective Project Implementation Workbook* (2007) can be used to help assess your readiness to implement a one-to-one mobile computing project. It employs a survey tool that examines readiness in each of 4 areas including: planning and focusing, implementing and monitoring, analyzing and reflecting, and sharing and celebrating (see http://www.1to1alberta.ca/resources/planning/workbook.doc and *Appendix E* for more information).
- A project charter template is available for use at http://education.alberta.ca/media/814641/project%20charter%20template%20for%20educationv2.doc. See also the sample charter in Appendix J.
- Tips and techniques for developing goals are available at http://education.alberta.ca/media/814653/tips&techniquesv3.doc.
- A communication toolkit is available at http://www.1to1alberta.ca/resources/reporting/CommunicationsToolkit.doc.
- An evaluation plan template is available at http://www.1to1alberta.ca/resources/planning/Spreadsheet%20PM.xls.
- For information about digital citizenship, see the *Digital Citizenship: Using Technology Appropriately* web site at http://www.digitalcitizenship.net/.

student-led conferences, school council meetings, daily teacher-teacher "hallway" conversations).

Establish supportive policies, protocols and procedures

- Establish policies, protocols and procedures (e.g., acceptable use agreements/policies, safety agreements, care and maintenance protocols, automated district update schedules, laptop lease agreements).
- Seek cooperation of staff regarding use of policies, protocols and procedures.
- Revise policies, protocols and procedures as needed (e.g., digital citizenship for students; student and teacher laptop and Internet use policies, laptop loss/damage policies, ever-greening policies, policies regarding computer labs (only for CTS)).

Allow for adaptability & flexibility

- Build in planning review cycles and revise plans, processes and procedures as necessary.
- Ensure plans are flexible and can be adjusted as needed.
- Allow for the need for emergent meetings.
- Proactively address issues associated with technical, pedagogical or administrative staff turnover.
- Allow for contingency costs in budgets.

Continuous Professional Development

Emerge Project participants believe that professional development opportunities should target educators' needs and contexts as their professional practice evolves. Another shared belief is that scheduled time for collaboration among teachers is needed to more fully realize the potential for one-to-one laptop learning in the classroom. It is also believed that ongoing assessment and evaluation of the desired outcomes of professional development and educator collaboration opportunities is needed to more fully understand their impact on evolving teacher practice in one-to-one laptop learning environments. *Emerge Project* participants offer their specific suggestions in these three areas as follows:

Professional development needs to

- ***be targeted to individual educators' needs and contexts as their professional practice evolves; and***
- ***provide opportunities for collaboration.***

Offer targeted professional learning opportunities

- Provide advanced preparation and training for teachers prior to implementing one-to-one laptop learning. One participant commented, "Remind teachers that they do not have to be "perfect," they just have to be better." Another participant advised that it is "better to engage teachers that volunteer rather than mandate teachers' involvement" in one-to-one laptop learning environments.
- Target professional learning opportunities to each educator's needs and contexts. This may be accomplished by designing professional development programs that can be personalized by each educator. For example:
  - Offer professional development opportunities that help teachers design 21st century learning environments that enable students to effectively use technologies.
  - Employ a variety of technologies (e.g., online courseware and applications) during professional development activities and ensure that technology supports and assistance are available onsite.
  - Provide a range of professional development experiences for novices and experts alike.
  - Ensure that educators new to one-to-one laptop learning are provided with the necessary background and professional development supports (e.g., partner new teachers with mentors skilled in implementing one-to-one laptop learning). In other words, allow for continuous entry by educators into an array of professional development opportunities.
  - Provide teachers with access to professional development coaches and/or educational technology integration specialists; people who can work with teachers and students in their classrooms to help them integrate technology and encourage collaboration and sharing.

One participant cautioned, "a smorgasbord approach to professional development is less effective than a streamlined-connected-systemic approach that targets professional development to teachers' needs."

- Ensure teacher assistants receive appropriate levels of training.

Schedule time for collaboration

- Provide teachers with regular and ongoing opportunities for collaboration to co-develop lessons and units, plan projects, and share successes, problems and solutions. Collaboration can occur face-to-face or online. It can be structured during the school day and embedded within professional development sessions. The key is to ensure teachers are not isolated.
- Coordinate timetables to allow for collaborative planning among teachers, schools and districts. One participating school scheduled one hour per week for teacher collaboration opportunities. This site also supported time for site visits. Teachers at another school met twice monthly. Technical and pedagogical leads were invited to monthly teacher collaboration sessions at yet another school.
- Increase opportunities for the development and growth of school/system-based communities of practice.

Monitor effectiveness of professional development on teacher practice

- Although *Emerge Project* participants did not offer specific suggestions about how best to monitor the effectiveness of professional development on teacher practice, several tools are being employed to monitor the evolution of teacher practice and the impacts on student learning (see the tips on the right).

TIPS & TOOLS

- The *Classroom Observation Rubric* (2008) developed by the Galileo Educational Network can be used to help monitor the evolution of teacher practice. See http://education.alberta.ca/media/815887/evidenceoflearninginthe21s%20centuryclassroom-rubric.pdf for more information.
- The *Classroom Assessment Tool Kit* (2003) http://education.alberta.ca/media/453470/div1to4.pdf is also available for use.
- Sheila Riley offers tips for preparing teachers for one-to-one mobile computing. See her article at http://www.schoolcio.com/ShowArticle/1010.
- The Council on Alberta Teaching Standards offers resources on the topics of differentiated instruction, evaluating teaching practice and teacher professional growth planning in their Dec 2006, Jan 2009, and May 2009 newsletters respectively (see http://www.teachingquality.ab.ca/WhatsNew/2009_3.html, http://www.teachingquality.ab.ca/WhatsNew/2009_1.html and http://www.teachingquality.ab.ca/WhatsNew/2009_5.html).
- BECTA offers several resources to support PD planning (see http://schools.becta.org.uk/index.php?section=pd ; http://schools.becta.org.uk/index.php?section=oe; http://schools.becta.org.uk/index.php?section=cu; and http://schools.becta.org.uk/index.php?section=tl).
- See Guskey, R.; *Evaluating Professional Development*; Corwin Press (2003).

Sufficient Technology, Infrastructure and Technical Supports

Teaching and learning need to drive technology, infrastructure and technical support decisions. Technical support needs should not be underestimated especially during the first year of implementation.

Emerge Project participants share a common belief that the facilitation of teaching and learning need to drive technology, infrastructure and technical support decisions. Participants also shared common experiences which are characterized by the following participants' quotes: "we didn't know what we didn't know" and "we underestimated our needs and the costs associated with technical support, especially during the first year of implementation." Their advice regarding technology, infrastructure and technical support planning is captured below.

Plan technical support to facilitate teaching and learning

- Focus technical supports on facilitating teaching and learning. Participants offered specific strategies to support this suggestion as follows:
  - Use an inclusive process to determine technical support needs. This includes the involvement of central and local technical staff in decision making so that everyone understands all the impacts and implications of the technical decisions being made. One school used a Wiki space to inform decision making through the compilation of requirements for teacher/student machines.
  - Involve teachers in the design of laptop images. Collaborate with teachers in the identification of standard technologies for use in classrooms and during professional development sessions (e.g., common technologies for Webinars).
  - Discuss the pros and cons of web site filtering. Participants are divided on this issue; some argue for improved web site filtering while others argue for more open policies especially to support the use of Web applications. Educators' viewed web site filtering as an impediment to learning, and technical controls or approval processes as cumbersome.
  - Plan to acquire a variety supporting technologies (e.g., flip cameras, student response devices (e.g., Senteos), data projectors, electronic whiteboards, document cameras, USB headphones, etc.).
  - Employ enterprise[1] wireless equipment and ensure it is operational before network use is required in classrooms.
  - To minimize security issues, consider implementing two networks, a wireless "student network" and a separate "corporate network."
  - Create guest access on networks where teacher- and/or student-owned devices are being implemented.
  - Provide external hard drives and/or shared drives for teachers and students to collect and share teacher learnings and student samples.

[1] Enterprise wireless equipment is defined as *equipment capable of handling the loads imposed on it by a large-scale network.*

- Involve technical support personnel in "communities of practice."

- Accurately estimate the technical requirements and the amount of technical support required for the project, especially during the first year of implementation. Although technical requirements and support needs varied among jurisdictions and schools depending on their level of technical sophistication and confidence, several participants suggested their needs were underestimated. Participants offered the following advice related to their technical needs:
  - Minimize issues by pre-testing all devices, infrastructure and wireless networks prior to use in the classroom.
  - Provide teachers and students with an orientation to each technology prior to initial use (e.g., one school reported creating a Web application user guide for teachers).
  - Dedicate onsite technical support personnel during the first year. Participants generally agree that additional technical support may be required during the first year but diminishes over time.
  - Establish technical support priorities and response time expectations. Participants did not feel that ad hoc technical support planning was adequate.
  - Develop new or revise existing policies including the following:
    1. Acceptable and/or appropriate use policies (AUPs) and/or contracts.
    2. Internet safety agreements.
    3. Protocols for the care and maintenance of personal computing devices.
    4. Digital citizenship policies. For example, revise student user agreements to incorporate the use of Web applications and the storing of student information on external servers with a focus on digital citizenship.
    5. Equipment take home policies and home use agreements.
    6. Onsite technical support policies.

    Use positive messages rather than prohibitive language when developing policies. Revise these policies or agreements annually as required.
  - Document terms of use, disclaimers, copyright restrictions, basic laptop technical support and wireless configurations. Update technical documentation as required.

TIPS & TOOLS

- More information about the implementation of wireless networks can be found in Alberta Education's *Wireless Local Area Network (WLAN) Best Practices Guide* (Oct 2007) at http://education.alberta.ca/media/822010/wirelessbestpracticesguid.pdf.
- A sample Acceptable Use Agreement can be found in Appendix J.
- For resources to support the use of videoconferencing, see VCAlberta at http://www.vcalberta.ca.
- See *Appendix F* for links to more information about the various technologies referenced in this section.
- BECTA offers resources to support ICT resource management (see http://schools.becta.org.uk/index.php?section=re; and http://schools.becta.org.uk/index.php?section=is).

- Develop lease agreements/contracts with parents that outline deductibles for damage/loss on laptops and peripherals. Lease agreements varied from school to school with some charging parents up to $75 over 3 years.
- Ensure a good warranty program is in place.
- Do not expect laptops to act like desktops. Their levels of support are different.
- Anticipate an increased demand for wireless in your school and jurisdiction.
- Reduce or eliminate technology downtime as much as possible. For example:
    1. Consider use of loaner/backup laptops for students and substitute teachers.
    2. Ensure central office and onsite technical support personnel are certified (e.g., Apple, Dell).
    3. Have spare power cords, chargers, and batteries available.
    4. Source longer life batteries.
    5. Barcode laptops for tracking purposes.
    6. Discuss issues at regular technology meetings (e.g., bimonthly).
    7. Automate collection of logged technical requests (e.g., FAME).
    8. Use appropriate applications to support wireless authentication and security, and protect computer configurations (e.g., Radius, WEP, Deep Freeze, Windows NT – Active Directory Group Policy). Balance protection of computers with user experience requirements.

- Plan for sustainability. For example:
    - Buy laptops instead of desktops during ever-greening cycles.
    - Move toward personally-owned devices and open access.

Involve various personnel in technical support

- Provide necessary training for all technical staff.
- Ensure local, onsite and jurisdictional technical personnel collaborate on a regular basis (i.e., avoid "silos"). Although many projects reported that they learned as they went, it was clear that more communication/collaboration between technical and pedagogical staff would have been beneficial. Communication among teachers, administration, technicians and the central office was considered key.
- Nurture trusting relationships among teachers and technical support personnel.
- Complement the efforts of just-in-time onsite technical support personnel. For example:
    - Mentor teachers and students so they are able to handle or work around minor technical issues. One jurisdiction developed a Students-Working-and-Assisting-with-Technology or SWAT program where students assist with basic technical trouble-shooting. Another jurisdiction involved students that were seeking a "work experience" to complement their course work.
    - Train interested teachers to provide technical support. Devolve minor trouble-shooting activities to teachers and/or students where feasible. Provide release time for technology-confident teachers.
    - Outsource additional technical support on as-needed basis.

- Provide teachers with access to educational technology experts and coaches.
- Use various means to communicate technical support information at a distance (e.g., email, videoconferencing, wikis and other online supports, help desk hotline, technology blogs, remote desktop, chat and live technical discussions, content management systems (e.g., Desire2Learn)).

Monitor effectiveness and efficiency of technical support

- Use a variety of tools and processes to monitor the effectiveness and efficiency of technical support. *Emerge Project* participants offered the following specific advice:
  - Manually or automatically track and record incident reports, requests, resolutions and response times. One school used an automated service request system where technical service requests were sent to a central repository for triage and response. A chain of command was then used for issue resolution.

    Another participant cautioned that documentation requirements should not be so onerous as to hinder response times.
  - Standardize service levels across the jurisdiction.
  - Integrate central and local technical supports to reduce redundancies.
  - Monitor/analyze network usage.
  - Maintain effective communications among technical and pedagogical staff.
  - Survey teacher and student satisfaction rates formally and informally.
  - Prepare and regularly discuss reports (local and divisional) that summarize technical support concerns and successes.

Ongoing Assessment and Evaluation

Important Note: This section primarily refers to the ongoing assessment and evaluation of student learning. See previous sections for more information about assessment and evaluation of implementation plans, evolving teacher practice, and technology-related aspects of one-to-one laptop learning.

A wide variety of ongoing formal and informal assessments are being employed with an increasing emphasis on the assessment of student engagement and attainment of 21st century skills using anecdotal and observational data.

Participants stress the importance of clarifying teacher and student expectations, and employing a wide variety of formal and informal measures and methods of assessment to accurately and fully evaluate the impacts of one-to-one laptop learning on student learning. Among these measures and methods, *Emerge Project* participants are increasingly recognizing the value of assessing student engagement and the attainment of 21st century skills using anecdotal and observational data. Participants offer the following advice.

Clarify expectations

- Clearly delineate academic, pedagogical, and technical expectations for students and teachers.

Employ various measures and methods of assessment

- Employ a combination of formal and informal measures and methods to accurately and fully measure the impacts of one-to-one laptops on student learning. *Emerge Project* participants report using pre- and post-assessments; assessments developed in-house, at the jurisdictional level or available commercially; as well as standardized assessments. "Assessment FOR Learning" principles are guiding many participants' assessment decisions. Some participants are also assessing control groups of students that were not involved in the project. More information about the various types of assessments employed is provided below:
  - Grade 3, 6 and 9 Provincial Achievement Tests and other student achievement assessments in the core subject areas.
  - High school retention rates.
  - Inquiry-based learning rubrics.
  - Surveys administered by participating schools or jurisdictions (e.g., student and parent surveys) or by *Emerge Project* researchers (e.g., Metiri tools). These surveys gathered information about students' ICT skills, student engagement (from cognitive, social and behavioural perspectives), students' interests, teacher-student interaction, teacher professional learning experiences, parent involvement and levels of satisfaction among various stakeholder groups with respect to various aspects including access to technology and technical support.
  - Observational data and anecdotal comments recorded by classroom teachers and central office staff during site visits and "classroom walkthroughs." Daily teacher journals were employed in one school. Several participants reported interviewing students, teachers, administrators, technical support staff and parents.

- Classroom-based assessments of inquiry projects, collections of student exemplars, portfolios of student work and students' reflections about their learning. Several schools are using electronic portfolios.
- Various commercially available tests and assessment rubrics (e.g., Writer's Companion program and "6+1 Traits to Writing;" Canadian Test of Basic Skills (CTBS) and Canadian Cognitive Abilities Test (CCAT); ESL Benchmarks (Elementary and Junior High) and Gates (High School)).
- Informal assessments through interviews, discussions and focus groups with various stakeholder groups, some of which are videotaped and archived.

- One participant suggested considering electronic or technology-based assessments and report cards.
- Several participants advised that measurements must be made over time as results may not show up during early stages of implementation due to "growing pains."

TIPS & TOOLS

- See *Appendix F: One-to-One Mobile Computing Resources* for links to specific commercially-available assessment tools.
- Alberta Education's "How to Conduct Satisfaction Surveys: A Practical Guide to Conducting Surveys within Alberta's K-12 Education System" (Dec 2005) can help to inform ongoing assessment and evaluation activities (see http://education.alberta.ca/media/443322/SatisfactionSurveyGuide_2005.pdf for more information).
- The *Classroom Observation Rubric* (2008) developed by the Galileo Educational Network can be used to help monitor the evolution of teacher practice. See http://education.alberta.ca/media/815887/evidenceoflearninginthe21s%20centuryclassroom-rubric.pdf for more information.
- The *Classroom Assessment Tool Kit* (2003) http://education.alberta.ca/media/453470/div1to4.pdf is also available for use.
- Alberta Assessment Consortium's "The Power of Assessment FOR Learning: Final Report" (Jan 2003) highlights the findings of phase one of an implementation study on improving student performance through classroom assessment (see http://www.aac.ab.ca/public/PowerofAssessment.doc for more information).
- The Council on Alberta Teaching Standards Dec 2006 newsletter offers additional resources on the topic of assessment for learning (see http://www.teachingquality.ab.ca/WhatsNew/2006_12.html).

Involved Parents and Communities

Parents and communities are excited about one-to-one mobile computing when they receive regular communications, are involved in decision making, feel that their issues are being addressed, and share in the celebrations of success.

Several *Emerge Project* participants suggest that parents and communities are excited about one-to-one laptop learning primarily due to school and jurisdictional staffs' efforts to regularly communicate and collaborate with them, to proactively address their issues (e.g., equity, acceptable use, and language barriers), and to showcase and celebrate successes along the way. Specific suggestions for involving parents and communities are provided below.

Communicate and collaborate

- Establish a collaborative environment by involving students, staff, parents and communities from the outset.
- Clarify expectations for students and parents.
- Use student-led and parent-teacher conferences, parent information sessions, parent open houses, town hall meetings, project kick-offs, and parent council meetings to provide progress updates, to address concerns, to demonstrate how technologies are being used to support teaching and learning, and to celebrate successes.

Proactively address issues

- Seek parental and community input and feedback on one-to-one laptop learning on a regular basis (e.g., satisfaction surveys).
- Disseminate and discuss acceptable use agreements/policies at parent information sessions. Discuss concerns related to excessive use of laptops at home (e.g., gaming). Encourage parents to monitor laptop use at home.
- Consider how you will deal with equity issues should they arise.
  - One school is providing laptop carts for use by students in non-project classrooms and is now considering the use of student-owned devices within 2 to 3 years. This school also reported that funding for a five-to-one student: computer ratio is being considered throughout their division.
  - Another school received parent council funding to provide laptops for all grade 4 students in their school—not just for those grade 4 students in the project classroom.
  - One school opted to have students and classes share laptops which meant that the devices could not be taken home. Participants noted that although one-to-one 24-7 access is ideal, the sharing of laptops was found to "promote collaboration, sharing and working together."
  - One school suggested when ever-greening technology, provide schools with the option to replace desktop machines or work stations with laptops.
- Address language issues that might be prevalent in communities with large English-as-a-second-language populations. This might entail having translators available, distributing

materials in multiple languages, and/or extensively involving students in the dissemination of information to the home.

Showcase/celebrate successes

- Showcase successes and impacts on student learning. One school videotaped interviews with students and used these tapes to raise awareness among the broader school community about how student learning was changing. Another school prepared an information sheet that explained how Web applications were being used in the classroom.
- Host biannual parent information meetings.
- Provide opportunities for stakeholders to see students demonstrate what and how they are learning.
- Contact local newspapers and radio stations to help you get the message out to your school community.

TIPS & TOOLS

- The *Emerge Project* communications toolkit (2008) can be used to help raise the profile of one-to-one laptop learning at the local level. It provides guidance in the form of questions related to your audience, key messages, tools and templates, and evaluation. See http://www.1to1alberta.ca/resources/reporting/CommunicationsToolkit.doc for more information.
- *A Practical Guide to Conducting Surveys within Alberta's K-12 Education System* (Dec 2005) can be used to gather parental and community Input and feedback (see http://education.alberta.ca/media/443322/SatisfactionSurveyGuide_2005.pdf)
- Alberta Education's "Encouraging Parent Involvement: Building the Learning Team" (2006) offers strategies and resources for developing parental involvement in education in ways that consider the unique contexts of individual schools or regions (see http://education.alberta.ca/media/525516/ipp2.pdf).
- The Council on Alberta Teaching Standards offers additional information about parental and community involvement in education in their Feb 2009 and Nov 2007 newsletters respectively (see http://www.teachingquality.ab.ca/WhatsNew/2009_2.html and http://www.teachingquality.ab.ca/WhatsNew/2007_11.html).

Comparative Studies of Lessons Learned

Comparative lessons learned by educators who have been implementing one-to-one laptop learning programs in the global community are provided in the appendices. For example:

- In *1-to1 Learning: Laptop Programs That Work,*[viii] Pamela Livingston presents a conceptual framework for implementing one-to-one laptop learning based on her extensive review of successful programs across the United States. This framework goes by the acronym EPC which stands for Educators, Planning and Commitment. See *Appendix G* for an excerpted summary of Livingston's EPC Framework.
- The authors of *Mobilizing the Millennials*[ix] present a similar blueprint for action. Seven areas of emphasis are suggested to those embarking on a one-to-one computing effort. These elements include leadership, funding, infrastructure/architecture, curriculum solutions, professional development, resources, and results. See *Appendix H* for a more thorough discussion of these elements.
- The Northeast and the Islands Regional Technology in Education Consortium presents another corroborating document that outlines lessons learned about providing laptops for all students.[x] The authors outline five areas that require careful attention so that program goals can be achieved including planning, training and professional development, hardware and software, managing change, and program monitoring and evaluation. See *Appendix I* for a more thorough discussion of these elements.

Studies of lessons learned by those implementing one-to-one mobile computing elsewhere compare to the experiences of Alberta's educators.

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Appendix A: Emerge Project Case Studies

Case Study 1: Hardisty Junior High School, Edmonton Public Schools

The following case study was adapted from the 2009 Status Report prepared by Terry Korte, M. Ed., Consultant, District Technology for Edmonton Public Schools.

Project Name: One-to-one computing to enhance literacy and 21st century skills for at-risk students

Overview:

The primary goal of the *Emerge Project* in Edmonton Public Schools is to enhance teaching and learning for approximately 150 at-risk students from grades 4 through 9 in seven district schools, including First Nations, Métis and Inuit (FNMI) students, low-achieving student populations, and students with special needs (including those in defined literacy programs). Ways are being sought to meaningfully engage students and to provide access to media-rich resources in order to support not only literacy, but also how teachers teach, and how students learn.

Case Study:

Introduction:

This case study focuses on one school (Hardisty Junior High School, HJHS), and one special needs student (Kate). The *Emerge Project* has been a catalyst for change at HJHS and has enabled teachers to address essential learning outcomes in a variety of ways. These changes have made a very positive difference for Kate over the past two years, including:

- Increased confidence with her peers. Kate helps others as much as she is helped. She sees herself as a capable learner.
- More access to audible resources through text-to-speech software. Kate can now complete reading assignments without a teacher's assistant.
- Increased differentiation of instruction. Teachers provide multiple ways for students, including Kate, to represent what they know, as well as present content in a variety of ways.
- Increased organization. The laptop is an organizational tool for Kate. She uses *SchoolZone* (Edmonton Public Schools student portal) to keep track of her homework, materials, and grades.

Hardisty Junior High School:

HJHS is on the leading edge of technology integration in Edmonton Public Schools. As the first middle school in the city to allow students to bring their own laptops into the building, HJHS has made a commitment to incorporating technology as a tool to enhance all curricular areas. As such, HJHS has two traditional computer labs, one mobile laptop lab, and each classroom is equipped with technology such as data projectors, electronic whiteboards and a robust wireless network. The school also provides access to laptops for students who may not have their own.

As part of the Edmonton Public Schools' Emerge Project, HJHS provides each student in one grade seven class with a laptop computer for their exclusive use through the school year. There is a cohort of four teachers who collaborate on curriculum and materials, and who look for ways

to integrate technology where appropriate in their classes. In addition, HJHS will be one of the six pilot schools in the district's *My.epsb.ca Student Portal Project,* which will increase student access to school resources by providing them with secure, online tools for creating and collaborating on their school assignments and projects.

Kate:

After home-schooling for grades 4-6, Kate entered junior high at HJHS as part of their initial one-to-one laptop *Emerge Project* group. While she had used technology extensively at home with her mother's support, many of her peers at HJHS were quite new to the idea of ubiquitous access. With all of the students starting at the same place, she found herself as "just another student" trying to cope with this increased access. With all students having access to a laptop and assistive tools such as *Microsoft One Note* (for audio recording and notes) and *Read & Write Gold*, she did not stand out from her peers as she might have as a special needs student integrated into a class. On the contrary, Kate excelled in this environment and has become an honor student.

The writing supports that the laptop provided enabled her to work without the constant help of a teacher assistant. The independence the laptop afforded Kate has completely changed the junior high experience for her. When Kate's mother Wendy considers what schooling for Kate would have been like in a traditional setting, she is convinced that HJHS and the *Emerge Project* have made a tremendous difference for Kate in terms of seeing herself as a capable learner.

Other Stories:

There are many examples across the seven schools in the project where similar positive impacts are being realized. Many of these stories are highlighted on the project's internal website. The project has been using a shared site for communication and collaboration between staff in the project. It includes a repository of research reports from Metiri, journal entries from teachers, student exemplars, shared files and professional learning documentation.

Case Study 2: Igniting the Future Today, St. Mary School Edmonton Catholic Schools

The following case study was adapted from the 2009 Status Report prepared by Ray Rouleau, Technology/Lead Learning Mentor Teacher, St. Mary Professional Learning School, Edmonton Catholic Schools.

Project Name: Igniting the future today – improving student learning in targeted areas

Overview:

St. Mary's Igniting the Future Today project is striving to develop 21st century skills which include critical thinking, problem solving, inquiry based learning, relational skills, ICT literacy and improved reading and writing skills.

The target group of 102 students began with three Grade 5 classes and one Grade 6 class in 2007-2008. This target group expanded to 125 students with four Grade 5 classes and one Grade 6 class in 2008-2009. In 2009-2010, the target group consists of four Grade 5 classes. The target courses include the core subjects English language arts, mathematics, science, social studies and information and communication technology.

This initiative has been a catalyst for all students in St. Mary's Grade 3-6 classes to have a one-to-one laptop learning environment. The students and parents are very excited that students are taking their tablet PCs home. St. Mary's staff, Edmonton Catholic Schools district and the community are also pleased with the exemplary results in the students Provincial Achievement Test results and in Metiri's research analysis of Alberta Education's Emerge project.

Case Study:

The central question for St. Mary School's Emerge Case Study is "Has student learning improved with the integration of ubiquitous technology in a one-to-one laptop learning and wireless classroom?"

In response to this question, the project lead

- reported improvements in student learning as evidenced by increases in the PAT results as well as through Metiri's research analysis over the past few years; and
- saw a strong correlation between high levels of student engagement, well designed inquiry-based projects/lessons and an improvement in student learning.

The project lead also reported

- that the leadership needed to communicate a shared common vision to all the education stakeholders;
- that the school administrative team was key to enabling the transformative learning environment to emerge; and
- that all educational stakeholders including school administration, project lead, teachers, students, parents, school technician and district support have worked collaboratively and have been equally vital to the successful implementation of St. Mary's project.

St Mary's vision for successful implementation focused on the following dimensions:

- Site-embedded professional development;
- Research into appropriate pedagogical models;

- A commitment to enriching and expanding student learning by using current and emerging technologies with a focus on continuous improvement that includes research on best practices in the exemplary use of technology;
- Providing students with individual laptops so as to direct their own learning; and
- A greater reliance on active learning strategies, student engagement in problem solving, and critical thinking with students consistently showing a deeper understanding of curriculum with more flexible use of emerging technologies.

Expectations for the project included:

- An increase in student proficiency using technology to embrace teaching and learning;
- High standard of academic achievement;
- Enriched learning experiences for students and teachers; and
- Increased learner engagement.

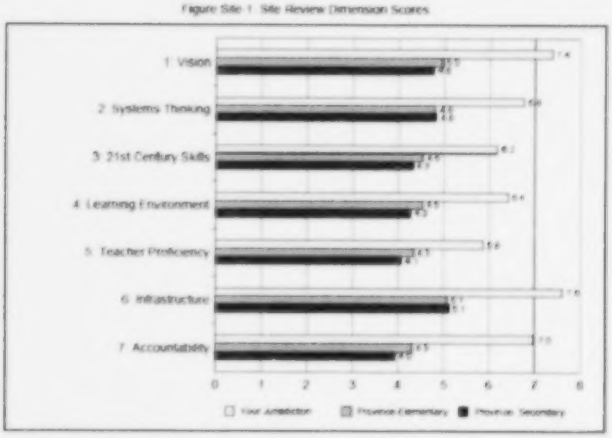
Project supports included:

- A working network infrastructure;
- Reliable and exemplary technical support;
- Extensive professional development supports for the teaching staff (e.g., ongoing site-embedded professional development is provided by the full-time onsite technology mentor who works with teachers and their students to help them integrate technology into core curriculum within the classroom environment, open area research center and from home to school); and
- Sharing of professional knowledge through a shared vision of relational work to build leadership capacity and by sharing best practices in teaching and learning with other schools in the District and province (e.g., learning is shared with others through communities of practice, teachers are mentoring each other and providing professional development to others, in-services are being offered through a partnership with the Edmonton Regional Learning Consortium and our Smart Showcase School initiatives).

The project lead noted several impacts of the project on St. Mary's School community as follows:

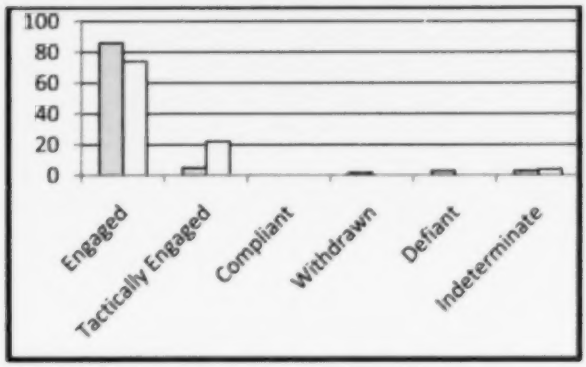
- The Site Review Dimension Scores noted by Metiri and seen in the chart below indicate that St. Mary's School has scored very well in terms of the seven measured dimensions.

Figure Site 1: Site Review Dimension Scores



- Teachers and students are learning how to maximize online tools and environments to collaborate, share and create new knowledge. Each classroom was equipped with a Smart Board, document camera, tablet PCs and subscriptions to Discovery Educations' and BrainPOP's streaming and educational videos/activities. Teachers are using and integrating rich multimedia and interactive websites including LearnAlberta.ca as an integral part of their day-to-day lessons.
- A growth in student engagement and in teachers planning of highly engaging lessons and projects for their students has been observed. The incorporation of rich online multimedia resources and the accessibility of varied software and hardware have heightened the excitement of the whole learning community. Students are able to produce projects that have personal relevancy and output their project in a format that makes sense for them and their intended audiences. These personalized choices and the "cool factor" of the new technologies are contributing to increased student engagement.
- Teachers have also designed projects and lessons that are inquiry based and encourage the development of critical thinking, creative thinking and authentic problem-solving skills. These types of lessons and projects are also increasing student engagement as conversations develop and continue in the classroom, home and online communities. Observation of these conversations is possible through chatting tools, blogs, wikis, OneNote Live Share and email. Students are also happy to explain their learning and projects.

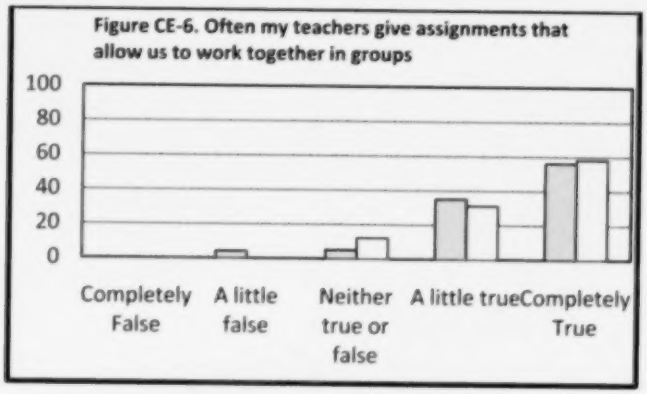
Figure SE-1: Overall Engagement



Elementary N=59; Secondary N=27

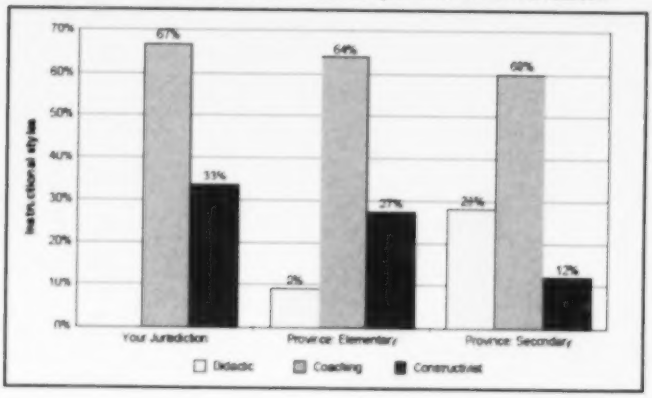
- A growth in 21st century learning environments was noted where teachers are facilitators and students are collaborative learners. Students are working collaboratively in groups with other classes in the school or through videoconferencing. All classes collaborate on weekly activities with their buddy classes (i.e., mixed grade groupings that allow for student mentoring).
- Visitors to the school see students utilizing many spaces within the school as opposed to staying within the confines of the classroom. Students are working in the hall, coatroom, the open resource area, the atrium or even outside in the "Secret Garden."
- Teachers have built student capacity in their classrooms with the formation of student groups including SWAT (Students Willing to Assist in Technology), SMTV broadcasting crews and First Lego League teams.

- The school is building teacher capacity with site-embedded professional development opportunities, scheduled teacher relational work and staff professional development. The school's partnership with Edmonton Regional Learning Consortium and their Smart Showcase initiative have also encouraged teachers to become teacher leaders who provide professional development to many staffs and districts throughout the province.
- Teachers' instructional practice has moved along the continuum towards the role of coach, encouraging peer-to-peer learning and shared mentorship. Teachers move around the classroom conferencing with students while encouraging peer-to-peer and collaborative group learning. The learning extends beyond the walls and time constraints of the classroom with online tools including blogs, wikis and a secure online portal environment called MyECSD. Videoconferencing also allows students to transcend the school and geographical boundaries by collaborating with other students and bringing in experts from around the world.



Elementary N=57; Secondary N=26

Figure Site-3: Degree to which various instructional styles were observed in the classroom



Summary:

All educational stakeholders in St. Mary's School community have seen the benefits from the successful integration of ubiquitous technology in educational resources, projects and pedagogy. The use of an inquiry-based approach and the vast array of possible end product formats utilizing

various technologies allows for creative and deep thinking. In the quest of new knowledge formation and creation, students have demonstrated the capacity to find relevant information and transform their knowledge in a personally meaningful way. Students enjoyed and excelled in projects where they were asked to create or invent a solution in an inquiry-based lesson or project.

Case Study 3: Emerge Project, Prairie Land Regional Division

The following case study was adapted from the 2009 Status Report prepared by staff involved in the PLRD Emerge Project.

Project Name: Emerge project 2008-09

Overview:

The central question posed by the Emerge Project in the Prairie Land Regional Division was "how can we provide our students with a wider pool of peers and access to subject specialist teachers in our small, remote schools?"

The following case study provides a response to this question by describing the experience of a fictional character named Connor McKenzie who represents a composite of the experiences of three PLRD Emerge Project teachers. The case study illustrates issues that were reported in PLRD's year one report, identifies the focus statement for PLRD's second year of the project, and incorporates the insights from interviews with students and teachers involved in the project.

Case Study:

Connor McKenzie was in his second year with Prairie Land, having come to the division in the fall of 2007, a recent graduate from the University of Alberta. Originally from a large urban centre, Connor had been hired to teach a variety of subjects ranging from junior high physical education to senior high mathematics and social studies in a remote rural K-12 school with a population of approximately 60 students. The transition from a large city to a small community was initially a difficult one, but he soon made the necessary adjustments to life in a rural setting. One of these adjustments was the adoption of video conferencing as a means to deliver programming to students in other schools throughout the division, as he was required to do for his Math 20-Pure class. As a part of the package, students enrolled in these classes were all given laptops, provided by the Emerge Project, for their own personal and school use.

Although PLRD encompassed a vast geographical area, their student population was very small, hovering around the 1500 mark. As a result, several schools fielded fewer than half a dozen students in some grades, which presented increasingly insurmountable budgeting challenges to administrators. For years, the division has been aggressively seeking ways to deal with these issues that were so closely linked with their declining enrolment, while simultaneously maintaining their impressive academic results. Already, schools were multi-grading, sometimes housing three grades in one classroom, and teachers were typically required to teach outside of their area of expertise. For a number of years prior to their participation in the Emerge Project, Prairie Land had been experimenting with video conferencing as a means of course delivery among its smaller schools.

After having survived his first year of teaching, during which he had focused on covering curriculum, mastering the hardware, and exploring ways in which to incorporate the laptops in a meaningful way, Connor, along with the other Emerge participants, reviewed the Metiri yearend report. Connor felt there were several areas of particular interest. The first was the low application of skills to problems that were complex and emulate work done in the real world. The second was the high proportion of teacher-designed assignments compared with student-designed ones. The third was lack of variety in teaching strategies and the dependence on direct instruction. The fourth was the low level of expertise that students demonstrated in self-direction and the effective use of real-world tools. The fifth was how rarely classroom observations noted self-directed learning,

collaboration and teaming, critical thinking and problem solving. The sixth was the respectable but not outstanding statistics derived from classroom observation regarding student engagement (50% were attentive, but not excited; 50% were engaged). The seventh was the lack of Socratic or high-level discussions, formal collaborative learning, and student-directed research that was observed.

As a part of their Emerge Project, participating teachers in PLRD met several times over the course of the year. At the first of these meetings, they set goals for the year in terms of their individual and school situations as well as for the Emerge group as a unit. The Emerge Year One Evaluation Report provided much of the data necessary to set their goals for year two and the group used the division's evaluation report to generate their shared goals. As a team, they chose increased student engagement, improved 21st century skills for students, and seamless teacher application of 21st century skills to enhance student learning as their target outcomes for the year. As an individual, Connor chose two target areas. The first was to improve students' adaptability, managing complexity and self direction. The second was to improve students' prioritizing, planning and managing for results. He resolved to merge the group's goals into his own growth plan—to improve student learning.

Connor's second year started substantially more smoothly than his first. In the previous fall, the division had held several parent meetings with those parents whose children were enrolled in the video conference courses. Parental support had been spotty, with a number of them expressing concerns about the viability of video conferencing. In the end, the laptops served to assuage some of their fears, although a small number of parents continued to express their reservations into the first two months of the first semester. In contrast, the parent meeting of Connor's second year revealed a much higher level of support. Having witnessed the successes of year one, parents seemed far more receptive to a second year of laptops and video conferencing.

Technological start-up issues were also much smoother in the second year. Whereas the first year had seen a delay in the delivery of the laptops, students in the second year received theirs immediately and were able to begin building relationships right away, quickly bridging their geographical distances. Connor also installed a math program that permitted easy generation of mathematical symbols and equations, thus facilitating enhanced communications in the subject. This year his students were also given notepads, which helped them write their answers electronically.

The elimination of community and technological distractions allowed Connor to focus on his target areas for the year. To measure improvement over the year, he created a rubric designed to measure "adaptability/managing complexity and self direction" and "prioritizing, planning and managing for results." He planned to administer three assignments throughout the year that would require students to utilize these 21st Century skills, and track the progress they made in these areas.

The year progressed well in most ways. Connor noted some improvements in his target areas, but felt that students still depended too much on teacher support and guidance in their learning. After two such assignments, Connor decided to address the challenge more fully. Rather than creating small assignments for students to hone their self-direction and management skills, he completely handed over the learning responsibilities to the class for an entire math unit. He divided the section into its major concepts, and assigned each to a student. The students' job was to master the concept, derive ways in which to impart that mastery to their peers, create authentic activities to provide practice, and to design an assessment tool that would reflect current assessment-for-learning philosophy.

When Connor first presented this project to the class, they were a little more than apprehensive about it. "How are we supposed to teach?" they said. "We don't know how to do this. Besides YOU'RE the teacher!" As they worked, however, they started to get excited about being in charge. Most of the students concentrated mainly on using the text book as a resource, although they were required to use outside sources as well. During the two week project, Connor guided students individually as they worked on mastering the concept. They used their laptops to find resources and make a SMART notebook presentation. After they presented their topic, the students also gave an assignment, which usually consisted of questions from the text book. At the end of the project, the students wrote a unit exam, and had results similar to the previous year, when Connor taught it in the traditional manner. At the end of the project, the students completed a rubric on their presentation. Most said that they were nervous, and could have done better if they had involved the class more, and prepared more by practicing in advance. The most encouraging result however was that every student said that they enjoyed this project. Given these results, Connor decided to have the students teach another unit at the end of the year. This time their presentation skills were much better, and students began relying less on the textbook and Connor, and began finding new ways to teach the subject matter. They found interactive games and demonstrations online, which helped keep the students more engaged. Since it was one of their peers that had found these things, they were more eager to accept them, and use the different methods that were presented. They were more willing to take risks the second time, although they still worked under Connor's guidance. They were much more motivated to master their concept as they realized that they were responsible for their own learning, as well as their fellow students. Over all, Conner was impressed with the project, as it gave students more ownership of their learning, and allowed them to communicate it in different ways.

As Connor heads into his third year of the Emerge Project, he carries with him the lessons learned in his first two years. He plans to develop an expert base that he can tap into throughout the year.

One other challenge that Connor and the core group of Emerge participants hope to address is the difficulty of gathering as a collegial group at regular intervals throughout the year. Although the meetings provided an excellent opportunity to share ideas, pursue professional development, and seek advice for specific situations, attendance was poor at these meetings. Two teachers, Connor being one of them – regularly attended, but the rest of the teachers had, at best, a spotty presence. This lack of attendance occurred when teachers taught in a semester other than the one the meeting took place in or simply due to lack of teacher incentive. In consultation with the project coordinators, it has been decided to review the format of these meetings for the following year. Under consideration are a number of strategies such as using video conferencing as a forum for these meetings, establishing dates at the beginning of the year rather than as they went along, and having administrators mandate attendance for the Emerge teachers.

Case Study 4: Increasing Aboriginal Achievement in the 21st Century, Ashmont School, St. Paul Educational Regional Division

The following case study was adapted from the 2009 Status Report prepared by Kathy Howery in collaboration with Robert Tymofichuk, St. Paul Educational Regional Division.

Project Name: Increasing Aboriginal achievement in the 21st century

Overview:

Ashmont Elementary School is a K-to-12 school in north central Alberta. This school has six classes of primarily Aboriginal students who are, with the guidance of their teachers and the enthusiastic support of their parents, embarking on a journey towards 21st century learning.

In this project, grades 5 and 6 students in the school are learning in a technology-infused environment—an environment where teachers use Smart technologies to support their instruction; where every student has their own laptop; where web-based tools and applications are becoming as common as pencils and books; and where it is hoped that the level of engagement, motivation, interest and achievement will improve among First Nations students.

The multiple goals of this project included improvements in student achievement, student attendance, teacher practices, motivation and support for students with special education needs.

Some questions identified in the original project proposal were as follows:

- Will providing these students with personal laptops and access to 21st century learning environments support gains in their achievement?
- Will this technology-rich, personalized learning environment influence the attendance rates at school?
- Will the one-to-one laptop learning environment provide the tools, strategies and supports required to meet the needs of our diverse student populations (e.g., especially those students with identified communication disabilities and behavioural problems)?
- Will literacy (i.e., language proficiency (in English) and numeracy) improve among our students through the use of laptops and other emerging technologies?
- Finally, arguably most important of all, how will the project positively impact motivation of Aboriginal students and their teachers? In other words, can the new opportunities for teaching and learning facilitated by technology support a learning environment characterized by informal classroom organization, culturally relevant material and group-work and that produce positive results for our students?

Answering these questions is clearly a complex task. The impact of any one intervention, even as tangible as putting technology into the hands of each student, is hard to break away from the whole. But change can be documented. Evidence can be gathered through observations, conversations, reviewing students work and other data to understand how the project is unfolding.

Case Study:

This case study provides a snapshot of grade 6 students in year 2 of the project. The snapshot was developed using interviews, observations, some quantitative data, and conversations with the project lead, teachers, administration, students and parents who were also employed by the school. A small sample of student work was also reviewed.

This snapshot reveals the emergence of several themes, some of which are directly linked to the district goals outlined above. Themes include pride, connection, engagement, attendance, achievement and satisfaction.

- *We are PROUD!*

  Perhaps the most pervasively seen theme is that of PRIDE. Everyone attached to this project is extremely proud of the project. Teachers are proud of being selected for it and proud to be involved in something exciting that was important to people at a high level. Parents are proud of the extra effort exhibited by the teachers, and proud of what and how the students are learning. And most importantly, the students are proud of themselves and their school. One young student suggested in response to a question about what others should know about his school *"if you want to learn more, come to Ashmont, we have all the learning material!"*

  Based on the literature on Aboriginal learners this sense of pride in school and personal pride in self as part of school activities is too often lacking. What is happening at Ashmont School has built a sense of belonging—we are worthy, we are special, we are *part of* something really important.

- *We are CONNECTED!*

  Another emerging theme was that of being *flexibly connected*. This theme, as it suggests, extends in many directions. Students felt connected to their teachers even when they were working alone with headphones in the hallway. The teachers use Synchronize, a technology that allows them to 'watch' what any student is doing on their laptop at any given time. This technology allows for a "tight but loose" learning environment where teachers maintain control, but foster a sense of self-direction and autonomy in the students. For example, students are aware they are "being watched" so there is little, if any, inappropriate surfing behavior. Sometimes students go to their favorite website to get a new background for their desktop, but they come back. They recognize that they have the flexibility to engage in these types of sidebar adventures on the web, but they remain connected to the teacher and the task and do not seem to wander too far afield.

  This flexible connection was also identified as being a paradigm shift for teachers in the school where they see themselves as facilitating rather than directing the learning. One teacher commented "the technology changes the role of the teacher – not all the information comes from the teacher. We are giving them the skills to help them wade through [the information]."

  Students are also are connecting with and to each other. For example, when students started using Moodle they began chatting with other classrooms, minimizing their isolation. Parents report that students are working together and helping each other in class, as well as connecting and communicating with students from other schools and communities. Parents are also reporting that students in the project are more willing to share what they are doing than

students in other classes. Given the community's transitory nature, connections among students are important especially when new students arrive in class.

Parents are also reporting that they see, feel and value the home-school connection more strongly that before the project began.

The principal at Ashmont School is pleased with the peer communication and collaborative working environment in the school stating "kids here are learning about relationships, the whole room is sharing [their] learning".

Students are also given opportunities to connect to their native culture through project-based learning opportunities. One student spoke enthusiastically about their Iroquois documentary project about the Peacemaker where Audacity, Moviemaker and Blogster were used to assemble images, video, audio and text. Another example involved creating an opportunity for students to engage in participatory government as described in the vignette below.

> *Participatory Government in Action*
>
> *The students were trying to make decisions about the year-end party. Instead of having students vote on which of two options they would prefer and the most votes wins, technology was used to help the student organizers gather all voices – participatory government. Students blogged about their opinions and why they felt their choice would be best. This gave "voice" to every student in the class in a very non-threatening manner. Students did not have to speak up, did not have to openly contradict each other. They had a venue to be heard and to respond that supported each voice in a respectful way. The student organizers were then tasked with taking all the input and coming up with the best decision based on all voices, a type of decision making reflective of native cultures. The tie to native ways was clear, the power of the technology to facilitate this was evident, and the authenticity of the learning apparent.*

- *We are ENGAGED!*

Observations, interviews and discussions reveal that students are engaged and focused on their learning. For example, students say "*we are doing things that make it easier to learn,*" "*class is a whole lot better,*" "*learning is easier and more fun,*" "*I love math, reading and science,*" "*I pay more attention to the teachers and got less chatty.*"

Teachers reported that technology allowed them to create more personalized learning environments for their students and as a result, their students were more aware and involved in their learning. For example, books with animations and text-to-speech support are being used to support student learning. Text-to-speech software supports those students who benefit from hearing as well as seeing the text as they read. It also helps students become more aware of their errors when their own writing is read to them. Students are using word processing software and spell check when writing, Google when doing research, and digital highlighters when reading digital text.

In addition, students are provided with opportunities for oral storytelling as well as blogging and digital storytelling. Digital stories are being stored and shared with other students and with their teachers. Literacy is a challenge in these classrooms so personalizing students' access to information is an important way to support literacy learning.

Teachers also appreciate the 80 minute blocks when undertaking larger scale projects. During these time blocks, students were engaged in their learning. They designed rubrics for assessment, gathered information from various sources for their projects and received specific feedback on their projects.

- *We BEHAVE!*

  A clearly achieved goal for this project is that of reduced behavior problems likely because students feel connected, engaged and competent. The numbers bear this out. In the year before the project began there were 138 behavioral incidents reported in the grade 5 classes and 85 in the grade six classes. In the first year of the project these numbers were reduced to 50 and 31 respectively. This is an astonishing drop of nearly 70%! The reduction in reported behavioral incidents continued in year 2. In the 2008/09 school year there were only 27 incidents reported for grade 5 and a mere 22 for grade 6.

- *We ATTEND?*

  Attendance data has not improved over the course of this project but is attendance something that can be realistically influenced by this project? Students in grade six are not always in control of their attendance at school, no matter how much they may love school they may not always be able to get themselves there, especially in a rural community. Transience and other community-based issues may suggest that the district reassess whether this goal is valid for the project.

  However, thinking about attendance in terms of quality versus quantity may be more appropriate. When students *are* present in these classrooms, they are *actively present* and engaged. They are in class, not in the principal's office. They are "awake" to the learning. To quote one student "before the laptops I would fall asleep." So perhaps it can be argued that the quality of attendance has been positively impacted if not the quantity.

- *We ACHIEVE!*

  Teachers reported that achievement had gone up for students. A review of Grade 6 PAT results for 2006 to 2009 show that the percentage of students who are scoring in the "acceptable" range in mathematics is improving from year to year. In 2006-07 students scoring in the acceptable range was 37.3%, in 2007-08 (the first year of the project) this rose to 51%, and in this past year it rose to 54.9%. While increases were not as dramatic in other subject areas, there was marked improvement in language arts and science. The Ashmont story suggests that technology rich learning environments may be one of the keys to alleviating barriers to academic success for Aboriginal learners.

  Students shared the belief that they were doing well in school but some were concerned that their achievement would drop when no longer in one-to-one laptop learning environments.

- *We are SATISFIED!*

  Teachers' satisfaction rates are improving at Ashmont School. More teachers are reporting that their students are finding learning interesting, rising from 68% in 2007, to 87% in 2008, and to 96% in 2009. More teachers are satisfied that students have opportunities to learn about computers, rising from 91% in 2007, to 96% in 2008, to an astonishing 100% in 2009.

This project is transforming education for both the teachers and the students. It is providing authentic, culturally rich experiences for students, exciting teachers about the power to engage and challenge students, and creating a positive culture where students see themselves as successful and proud of their school.

Summary:

Have all the goals been achieved? Not yet. A continued focus on basic literacy may pave the way to 21st century learning and prepare students for a variety of learning experiences. More targeted and intentional use of assistive technologies to supplement and support digital tools might be warranted especially for some students.

In the meantime, there has been a *transformation* at Ashmont School. A transformation experienced by these grade 6 students, their parents and their teachers, a transformation worth celebrating.

Case Study 5: The One-to-One Laptop Program – Creating Collaborative Learning Communities, St. Bernadette School, Calgary Catholic School District

The following case study was adapted from the 2009 Status Report prepared by Trisa Sorosky of St. Bernadette School.

Project Name: Increasing Aboriginal achievement in the 21st century

Overview:

The Calgary Catholic School District's one-to-one laptop learning project (2008-2010) provides students from five schools with the opportunity to have anytime/anywhere access to a wireless laptop computer. The students, now in grades 6, 9 and 12, have been assigned their laptops for school and home use for the duration of the project. The focus of the three-year project is to develop learner-centered environments based on the seamless infusion of technology.

The goals of the project are to help students develop the skills necessary to be effective and engaged contributors to society, demonstrate innovation and critical thinking skills, and explore their role and identity within a democratic society by engaging in collaborative learning opportunities. The project focuses on the following question:

> "In what ways can wireless mobile computing technology increase the engagement of students in democratic citizenship by providing a personalized learning environment through which issues of identity and community become the focus for the development of critical thinking, problem solving, and collaboration and communication skills?"

Case Study, St. Bernadette School:

St. Bernadette School is a small elementary school serving the south east communities of Lynnwood and Ogden in Calgary, Alberta. Before the project was introduced, the school had limited access to computers and the Internet, with only a few classrooms wired for Web access. The hardware in the school consisted of approximately 30 decade-old computers housed in the computer lab.

Computer expertise varied among staff, students and parents. Bernie Varem, St. Bernadette's principal at the start of the project, was very comfortable with and knowledgeable about computers and wanted to support and encourage the use of technology in the school. No other staff at the school had his level of computer experience. In fact, one grade 4 teacher at the school who was to be involved in the project had just started to use e-mail. She was excited but nervous about the project. The students at St. Bernadette had varied backgrounds in the use of technology. While some had access to the Internet at home and used it regularly, others did not. Fortunately, regardless of their own exposure to computers, students and parents were generally very supportive of the project.

Much has changed at St. Bernadette school in the two years since the project began. The school now has wireless Internet access throughout the building, providing anytime/anywhere access to the Web for all students and staff. The school not only has the original 32 laptops provided through the project, but all students from grades 3 to 6 now have laptops. In addition, two mobile carts of laptops for grades K-2 are available. With the availability of all of these mobile computers in the school and classrooms, staff are looking at re-purposing the computer lab recognizing that the old "go to the lab" model of computer use is now outdated.

Every classroom in the school also has an interactive whiteboard and LCD projector. Students have access to digital cameras, Senteo response clickers and a wide range of software such as Encarta, Kidspiration and Photostory.

Christa Stehr, who succeeded Bernie Varem as principal of St. Bernadette in 2008-09, has sustained and expanded the project through her leadership and passion. The nervous grade 4 teacher has become a pedagogical technology mentor to her colleagues. She not only embraced the technology, but leads well-attended "Learn at Lunch" sessions every week to help other staff learn about technology. Teachers also spent some of their professional development time encouraging and mentoring teachers from a nearby school in the use of technology.

This year, St. Bernadette School has restructured teaching assignments so that each teacher who has been a part of the project will be teaching a subject in grade six, thereby maximizing students' uses of technology for learning.

The changes at St. Bernadette have had a positive impact on student learning. The laptops have enabled the students to create personalized learning environments. The students are quick to extol the benefits of using laptops for writing, organizing their work using Microsoft OneNote, researching on the Internet and collaborating with each other and handing in assignments using D2L. Administrators and teachers report that students are engaged in their learning– they are on task, they are completing more assignments and they are happy to be at school. One student even stated that if there weren't any laptops he wouldn't come to school!

Students and staff are excited about what they are doing and want to share their learning with parents and other District personnel. Students took a lead role at a recent Open House by discussing their projects and showing guests how to use the technology. The Open House was such a success that a second one was hosted. All district teachers were invited to learn about how technology could be used in their classrooms. Again, the students took the lead, giving presentations for over one hundred participants. The students were pleased to have the opportunity to "show what they knew" and help others learn something new.

The entire school culture at St. Bernadette School has changed since the project began. The school has become a community of learners—students and teachers are learning from each other and their peers and colleagues as well as from other community members including parents, and teachers and students from neighboring schools.

As the students and staff prepare for year three of the project, they are looking forward to more opportunities to collaborate and communicate with others. They now have access to Microsoft Communicator which is helping to facilitate ongoing sharing of ideas and real-time conversations with the former principal and other grade 6 students in the one-to-one laptop program. Staff and students are also looking at global communities and ways they can make a difference in their world.

Reflection and Evaluation:

The experience at St. Bernadette School provides an example of how this project has been a catalyst for change within the one-to-one laptop schools in the District—impacting school culture around the use of technology to support 21st century learning. What began with one teacher and one class has become many teachers and many classes collaborating and learning together. Through their work in this project, they are learning that in order to create 21st century learning environments for their students, they need to

- become 21st century learners themselves;
- effectively use real world tools to create learner-centered environments;
- develop an understanding of visual literacy and information literacy;
- be willing to take risks, be creative and learn from the results; and
- communicate and collaborate with each other, with students, with parents and with the world outside the classroom.

The learning environments created at St. Bernadette School reflect the degree to which school leaders and teachers have embraced their own 21st century learning.

This year, their goal is to extend their collaborative learning communities to include two junior high and two high schools that will be receiving the students who have been involved in the laptop project. These schools are being invited to participate in discussions around the issue of sustainability and how students might best be supported as they transition out of the laptop program and into new school environments.

Additional goals for the project include ensuring that the new schools are equipped for success by making them aware of the needs and experiences of the laptop project's pioneering students. "Like a rock tossed in a quiet pool, the one-to-one laptop project has begun to send its ripples across the education pond in [the] District. [They] are only just beginning to see the impact of these ripples on our 21st century learners."

Appendix B: Emerge Project – Participating Jurisdictions

No.	Lead	Theme[2]	Description of Initiative (*Source: http://www.lnt.ca/technology/emerging/parjur.asp*)
1	**Battle River Regional Division No. 31** Zone 4	1&2	Using One-to-One Mobile Computing to Enhance Research, Communications and Assessment Skills in Senior High English and Social Studies **300 students, 4 teachers, 2 administrators, 3 schools, Grades 10-12.** Will focus on improving student writing, critical thinking and presentation skills in English and Social Studies.
2	**Black Gold Regional Division No. 19** Zone 2/3	2	1 2 1 (One-to-One) **102 students, 6 teachers, 2 administrators, 1 school, Grades 5-9.** Will focus on universal design to increase the diversity of presentation styles to improve writing and communication skills in Covenant Christian School. Good support from all levels including parent community and Christian Society. Strong professional development plan in place. Commitment from district and community to sustain the project beyond 2010.
3	Calgary Roman Catholic Separate School District No. 1 Zone 5	2	Engaging Students in a One-to-One Mobile Computing Environment **100 students, 12 teachers, 3 administrators, 3 schools, Grades 4-12.** Will focus on communication, assessment for learning and differentiation. Will provide with 24/7 access to laptops with an initial focus on Social Studies. Will explore assessment for learning strategies, differentiated learning and the attainment of 21st century skills. Further supporting an AISI project promoting online collaboration tools.

[2] **Themes: 1. Enhancing teaching and learning for specific student populations; and 2. Improving student learning in targeted areas**

No.	Lead	Theme[2]	Description of Initiative (Source: http://www.lnt.ca/technology/emerging/parjur.asp)
4	Calgary School District No. 19 Zone 5	1	Assistive Technology and Learning: Supporting English as a Second Language Learners **120 students, 12 teachers, 2 administrators, 3 schools, Grades 4, 7 and 10.** Will focus on English as a Second Language. Grades 4 and 7 in full classes and Grade 10 students in congregated classes. Project will investigate the benefits of using Assistive Technologies, with both teachers and learners, to identify changes to the context of teaching and learning that may be required to achieve those benefits. Professional development plan will be addressed in-house though Innovative Learning Services.
5	Chinook's Edge School Division No. 73 Zone 4	1	One-to-One Mobile Computing Initiative: Improving Student Achievement through Technology and Assessment for Learning **120 students, 4 teachers, 4 administrators, 4 schools, Grades 6, 7 and 9.** Will focus on improving student achievement and implementing new assessment practices for high needs students in the areas of English and mathematics.
6	Edmonton Catholic Separate School District No. 7 Zone 2/3	2	Igniting the Future Today: Improving Student Learning in Targeted Areas **100 students, 6 teachers, 3 administrators, 1 school, Grades 5-6.** Will focus on core subjects specific to teaching and learning with technology and the attainment of 21st century skills. The project will begin with Grade 5 students who will keep the laptops through to Grade 6. The site has previous experience with 1:1 mobile computing, wireless infrastructures, imaging machine strategies and are willing to be a model site for our community of practice. Good Leadership model that will also be beneficial.
7	Edmonton School District No. 7 Zone 2/3	1	One-to-One Computing to Enhance Literacy and 21st Century Skills for At-risk Students **150 students, 12 teachers, 4 administrators, 6 schools, Grades 4-9.** Will focus on FNMI, Low Achievement and Special Needs by providing rich learning opportunities using assistive technology for learning. The schools are connected to pre-service teachers at the University of Alberta by supporting 400 and 500 level courses focused on assistive technology for learning.

No.	Lead	Theme[2]	Description of Initiative (*Source: http://www.lnt.ca/technology/emerging/parjur.asp*)
			The district has an online system for teacher professional development, student learning and parent communication.
8	Elk Island Public Schools Regional Division No. 14 Zone 2/3	2	Focus on Inquiry **80 students, 14 teachers, 1 administrator, 1 school, Grade 7.** Will focus on inquiry-based learning and evolving instructional practices that motivate low achieving students to become self-directed learners. Galileo and 2Learn providing professional development. Good support at all levels, both technical and educational. Clear vision supported by research. Students will keep the devices for the duration of the project (Grades 7-9).
9	Greater Southern Separate Catholic Francophone Education Region No. 4 Zone 5	1	Equity of Opportunity to Attain 21st Century Skills in Francophone Learning Communities **67 students, 4 teachers, 3 schools, 3 administrators, Grade 6.** Will use mobile computing to improve French language competencies in the classroom, at home and in the community. Students are given 24/7 access to technology, parents are involved in and support the project.
10	Greater St. Albert Catholic Regional Division No. 29 Zone 2/3	1	Learning with Technology Infusion Project **65 students, 3 teachers, 1 administrator, 1 school, Grade 4.** Will focus on universal design for learning, with an initial focus in Social Studies and Mathematics. Differentiated instruction and overall instructional strategies will be examined. Galileo will provide some of the professional development. The project will support the implementation of the new Social Studies curriculum with online/multimedia resources.

No.	Lead	Theme[2]	Description of Initiative (*Source: http://www.lnt.ca/technology/emerging/parjur.asp*)
11	Lakeland Roman Catholic Separate School District No. 150 Zone 2/3	1	MindsON Through 1:1 Technology Project **60 students, 4 teachers, 2 administrators, 2 schools, Grade 9.** Will focus on the acquisition of 21st century skills using emergent research on "How People Learn". The project will focus on student development of critical thinking and problem solving skills and developing self-directed learners within a diverse learning community. **Note:** Provided $130,000, in addition to the original $300,000, for the planning and delivery of two Summer Institutes in August 2007 and August 2008.
12	Medicine Hat School District No. 76 Zone 6	1	The 21st Century Classroom **160 students, 8 teachers, 2 administrators, 2 schools, Grades 4-6.** Will focus on the acquisition of 21st century skills and the enhanced learning of students in all subject areas, with a special focus on English Language Arts and Mathematics. Project will promote the use of technology as a tool in the learning process (including the use of multimedia tools and resources).
13	Northern Gateway Regional Division No. 10 Zone 2/3	1	Learning without Borders **100 students, 5 teachers, 2 administrators, 2 distinct geographical locations (360 km apart), Grade 4.** Will have the advantage of working with mobile computing both on and off site. Students will also have access to a variety of technologies, including assistive technologies, to help improve student learning. The project will examine the impact of anywhere, anytime learning on student engagement and achievement.
14	Palliser Regional Division No. 26 Zone 6	1&2	Enhancing Writing Skills for Low Achieving Students in the Community of Coalhurst **235 students, 17 teachers, 2 administrators, 3 schools, Grades 5-12.** Will involve implementing technology-mediated reading and writing activities to improve student success for low achieving students. Differentiation of instruction is a project focus, as well as new teaching and learning practices.

No.	Lead	Theme[2]	Description of Initiative *(Source: http://www.lnt.ca/technology/emerging/parjur.asp)*
15	Peace River School Division No. 10 Zone 1	2	Using One to One Mobile Computing to Enhance Learning for Grade Six Students **112 students, 10 teachers, 3 administrators, 3 schools, Grades 5-6.** Will involve Grade 5 and 6 classes with diverse populations of FNMI, French Immersion, English as a Second Language and special needs students in varying geographical locations. Focus will be on increasing student achievement and developing professional learning communities through 1:1 and videoconferencing.
16	Prairie Land Regional Division No. 25 Zone 5	1	Small Schools Preparing Students for Big Futures **58 students, 7 teachers, 2 administrators, 1 school, Grades 9-12.** Will initially focus on Grade 9 students, and the expansion of an effective program delivery model using videoconferencing. The project will provide students with anywhere, anytime access to curriculum and instruction in a rural community and will examine the impact on student engagement and achievement.
17	Rocky View School Division No. 41 Zone 5	1	UDL Breaking Down the Barriers to Learning **133 students, 10 teachers, 2 administrators, 3 schools, Grades 6-8.** Will focus on differentiating instruction, and using student-centered and technology innovations to maximize student learning. Each of these schools has a high number of students with diverse learning needs. This district is well positioned to implement and sustain the project. Research plan involves educational and technical measures for both qualitative and quantitative research.
18	St. Paul Education Regional Division No. 1 Zone 2/3	2	Increasing Aboriginal Achievement in the 21st Century **114 students, 6 teachers and 6 assistants, 1 school, Grades 5-6.** Will focus on increasing the level of student engagement, motivation, interest and achievement within First Nation, Métis and Inuit (FNMI) populations. Also involves the development of 21st century skills for students and teachers. Will blend laptop program with videoconferencing.

No.	Lead	Theme[2]	Description of Initiative *(Source: http://www.lnt.ca/technology/emerging/parjur.asp)*
19	Westwind School Division No. 74 Zone 6	2	The Power of One to One **226 students, 9 teachers, 5 administrators, 5 rural schools, Grades 3 and 6.** Will focus on digital literacy, inventive thinking, effective communication and high-productivity skills. Grade 6 classes will have 1:1, 24/7 access, and Grade 3 class will use a cart model. Galileo providing some professional development. Strong research components including both qualitative and quantitative research.
20	Wolf Creek School Division No. 72 Zone 4	1	Developing 21st Century Skills in Rural Multi-age Junior High Classrooms using One to One Mobile Computing - a Theme One Proposal to Enhance Teaching and Learning for Specific Student Populations **100 students, 10 teachers, 2 administrators, 2 schools, Grades 7-9.** Will focus on meeting the diverse needs of junior high students in multi-age classrooms that are the result of low-population rural communities. The 1:1 project will focus on developing 21st century skills, including critical thinking, problem solving, teamwork and communication skills.
			Approx Students = 2184 Approx Teachers = 159 Approx Admin = 50

Appendix C: Essential Components for Implementing Technology in Schools

Alberta Education adapted ISTE's National Educational Technology Standards (NETS)[xi] for Administrators for the Alberta context (see Chart 1 below). Alberta Education further customized these essential components and developed an evaluation guide for *Emerge Project* participants (see Chart 2 below).

Chart 1: Essential Components for Implementing Technology in Schools

Shared Vision The school board and school administrators provide proactive leadership in developing a shared vision for educational technology among school personnel, parents and the community.
Equitable Access Students, teachers/staff have equitable access to current technologies, (hardware/software), and resources.
Skilled Personnel District leaders, teachers and support personnel are skilled in the use of technology appropriate for their job responsibilities. (Technical training)
Professional Development District leaders and staff have consistent access to technology-related professional development for their job assignments. (Pedagogy)
Technical Assistance Personnel have technical assistance for maintaining and using technology.
Content Standards and Curriculum Resources Instructional personnel, school leaders and teachers are knowledgeable about content and technology standards, related ICT curriculum and resources and the use of technology to support learning.
Student-Centered Teaching Teaching in all settings includes the use of technology to facilitate student-centered approaches to learning.
Assessment and Accountability The school and district has a system for the continual assessment of effective technology use for improving student learning.
Community Support The district and school maintains partnerships and communications with parents, businesses and the community to support technology use within the district.
Support Policies The school and district has policies, financial plans and structures to support the use of technology in learning and in operations.
External Conditions Policies, requirements, supports and initiatives at the national, regional and provincial levels support the school/district in the effective implementation of technology for achieving curriculum outcomes and technology standards.

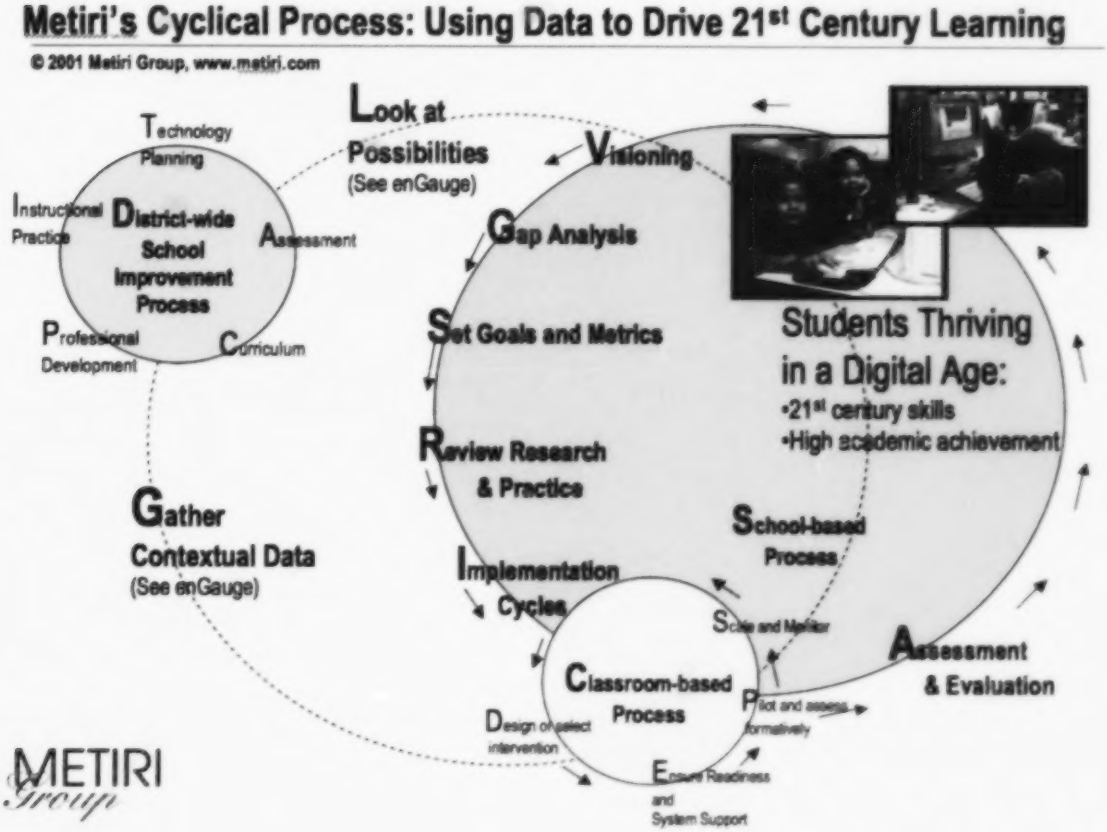
Chart 2: Essential Components Evaluation Guide

Related Evaluation Question(s):	*Indicator(s) of Success*	*Indicator Measure(s)/ Source(s)*	*Data Collection Instrument(s)*	*Frequency of Data Collection*	*Use of Results*
Professional Development *What professional development plans are planned, in place, or completed for this year. How effective is the professional development?*					
Promotion of 21st Century Skills *How are 21st century skills promoted, to what degree are teachers, administrators and students learning and using these skills?*					
Integration of Curriculum/Technology *How are teachers integrating technology into their curriculum?*					
Multimedia Resources/Software *What types of multimedia resources/software is being actively used by teachers and/or students? How are these resources used?*					
Network Architecture *Is a network architecture in place? How stable is the network? Who has access to the network? Does access extend beyond the school day?*					
Security Measures *What security measures are in place? If needed sites are blocked how effective is the process for a teacher to have a site opened-up?*					

Related Evaluation Question(s):	*Indicator(s) of Success*	*Indicator Measure(s)/ Source(s)*	*Data Collection Instrument(s)*	*Frequency of Data Collection*	*Use of Results*
Hardware Acquisition/Deployment *Are there sufficient amounts of hardware available to all students, teachers and administrators?*					
Technical Support and Training *What is the process for technical support to repair a problem, or setup a new piece of hardware/software? How efficient is this process?*					
Community Involvement *How effective are the strategies in place to ensure community consultation, collaboration and communication?*					
Ongoing Evaluation *How will the evaluation continue to be monitored and evaluated?*					
Other					

Appendix D: The Cyclical Process: Using Data to Drive 21st Century Learning

The following six-phase cyclical process can be used to support the design and implementation of technology-based learning solutions. Each phase of the process is briefly described below the diagram. More information about this web-based resource is available on the Metiri Group web site at http://www.metiri.com/CMC/INTRO.html.



1. **Visioning**
   a. Considering life and work in a Digital Age
   b. Review of 21st Century Skills
   c. Review new instructional practices
   d. Establish shared vision
2. **Data Gathering**
   a. Assess progress towards the vision
   b. Reviewing and updating school improvement priorities
   c. Profile the system using enGauge or similar tool
3. **Goals and Metrics**
   a. Establish goals
   b. Identify evidence of success/Establish benchmarks

c. Collect and analyze baseline data
d. Marketing

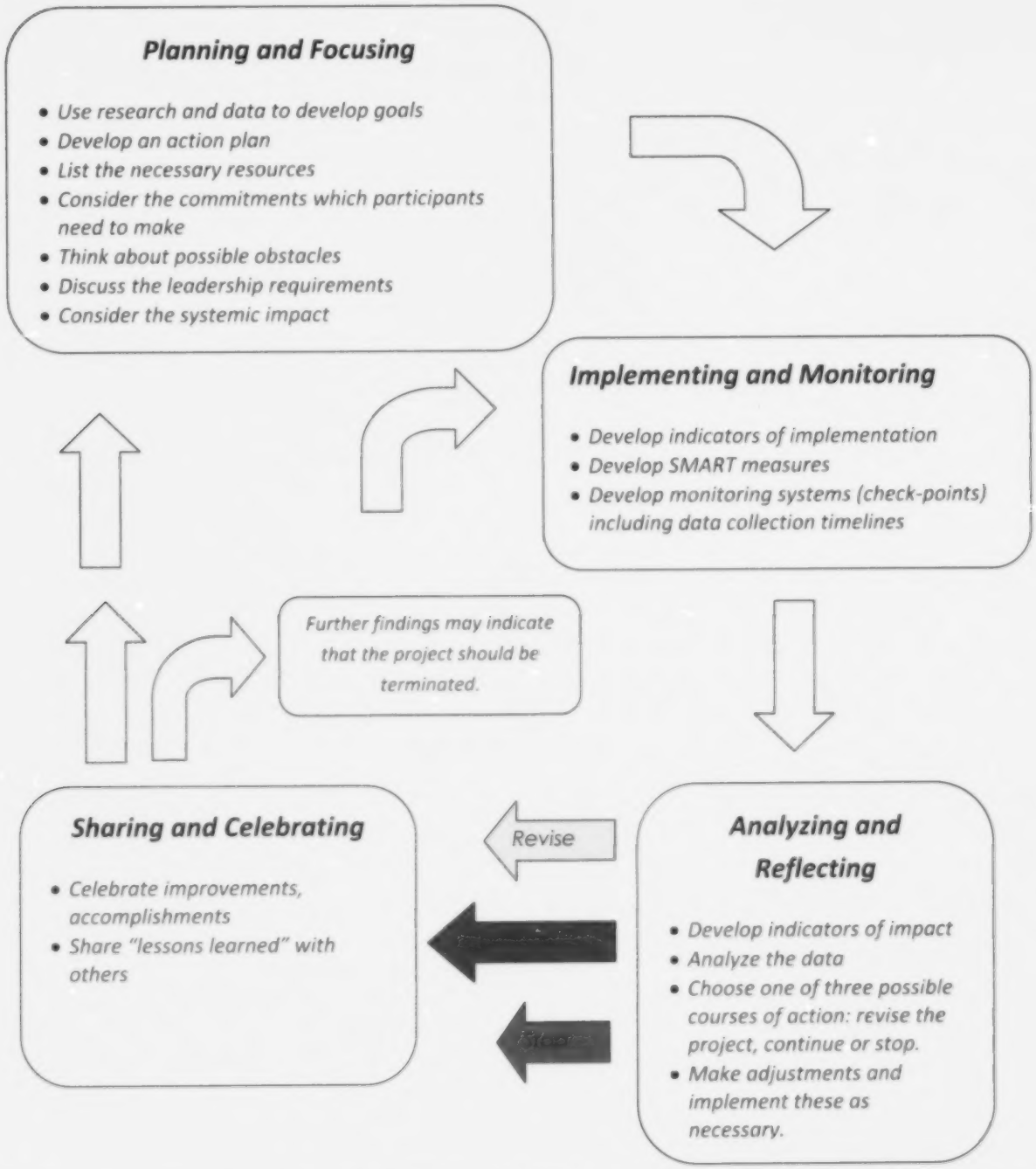
4. **Reviewing Research and Practice**
   a. Review research, best practices, and future trends (content, field practice, technology)
   b. Technology role in supporting practices

5. **Implementation Cycle**
   a. Designing or select interventions (including progress indicators and benchmarks)
   b. Assessing readiness
   c. Ensuring systems support / professional development
   d. Piloting/ formative assessment
   e. Implementation and monitoring (scaling up)

6. **Assessment and Evaluation**
   a. Gather assessment data
   b. Review progress on system indicators
   c. Review progress on student benchmarks

Appendix E: The Collaborative Inquiry Model

The following model was excerpted from "Pieces of the Pie: You Need All of Them – Effective Project Implementation Workbook" (2007). See http://www.1to1alberta.ca/resources/planning/workbook.doc for more information.


Planning and Focusing
• Use research and data to develop goals
• Develop an action plan
• List the necessary resources
• Consider the commitments which participants need to make
• Think about possible obstacles
• Discuss the leadership requirements
• Consider the systemic impact
Implementing and Monitoring
• Develop indicators of implementation
• Develop SMART measures
• Develop monitoring systems (check-points) including data collection timelines
Further findings may indicate that the project should be terminated.
Analyzing and Reflecting
• Develop indicators of impact
• Analyze the data
• Choose one of three possible courses of action: revise the project, continue or stop.
• Make adjustments and implement these as necessary.
Revise
Sharing and Celebrating
• Celebrate improvements, accomplishments
• Share "lessons learned" with others

Appendix F: One-to-One Laptop Learning Resources

Articles, Books, Papers and Reports Used by Emerge Project Participants

1. Alberta Assessment Consortium (prepared by GWM Consulting Ltd.; "The Power of Assessment FOR Learning: Final Report;" (Jan 2003); http://www.aac.ab.ca/public/PowerofAssessment.doc; Retrieved Oct 2009
2. Alberta Education; "Emerge One-to-One Laptop Learning Project Communications Toolkit: Sharing Information Strategies;" (February 2008); http://www.1to1alberta.ca/resources/reporting/CommunicationsToolkit.doc; Retrieved Oct 2009
3. Alberta Education; "Implementing One-to-One Mobile Computing in Alberta's Schools: A Support Resource – Summary;" (January 2010) (executive summary); http://education.alberta.ca/admin/technology/emerge-one-to-one.aspx
4. Alberta Education; "Implementing One-to-One Mobile Computing in Alberta's Schools: A Support Resource;" (January 2010) (full document); http://education.alberta.ca/admin/technology/emerge-one-to-one.aspx
5. Bevin, M. and Fisher, K.; "Pieces of the Pie: You Need All of Them! Effective Project Implementation Workbook;" (March 2007, Version 2.0); http://www.1to1alberta.ca/resources/planning/workbook.doc; Retrieved Oct 2009
6. Bonifaz, A. and Zucker, A; "Lessons Learned About Providing Laptops for All Students;" (2004); http://www.neirtec.org/laptop/LaptopLessonsRprt.pdf; Retrieved Oct 2009
7. enGauge 21st Century Skills; (2003); http://www.metiri.com/21/Metiri-NCREL21stSkills.pdf; Retrieved Oct 2009
8. Galileo Educational Network; "DRAFT: Evidence of Learning in the 21st Century Classroom: Classroom Observation Rubric;" (2008); http://education.alberta.ca/media/815887/evidenceoflearninginthe21s%20centuryclassroom-rubric.pdf; Retrieved Oct 2009
9. Guskey, R.; "Evaluating Professional Development"; Corwin Press; (2003)
10. Intelligence Online; https://www.iomembership.com/portal/index.html;jsessionid=A91AACDF90233030D1F94FC1452FEDC7.xtom101
11. Learning Cultures Consulting Inc.; "Technology's Influence on High School Completion: Literature Review; (Jun 2007); http://education.alberta.ca/media/823068/techandhighschoolsuccess.pdf; *Retrieved Oct 2009*
12. LearnAlberta.ca; http://www.learnalberta.ca/Home.aspx
13. Livingston, Pamela; 1-to1 Learning: Laptop Programs That Work; International Society for Technology in Education, Washington, DC; (2nd Edition, 2009)
14. Partnership for 21st Century Skills; "Learning for the 21st Century: A Report and Mile Guide for 21st Century Skills;" (Publication Date Unknown); http://www.21stcenturyskills.org/images/stories/otherdocs/p21up_Report.pdf ; Retrieved Oct 2009

15. Tapscott, D.; "Grown Up Digital: How the Net Generation is Changing Your World;" McGraw-Hill; 1st Edition; October 3, 2008

16. Underwritten by Hewlett Packard, Microsoft and Intel; "1:1 Computing: A Guidebook to Help You Make the Right Decisions;" (Publication Date Unknown); http://www.guide2digitallearning.com/downloads/HP1to1Guide_final2.pdf ; Retrieved Oct 2009

17. Underwritten by Intel; "Blueprint Solutions for K-12 One-to-One Computing Initiatives – A resource for education leaders and others interested in implementing one-to-one anytime, anywhere computing in K-12 education;" (Publication date unknown); http://www.k12blueprint.com/k12/blueprint/cd/02.PDF; Retrieved Oct 2009

18. Underwritten by Intel; "Ubiquitous Computing Enables Anytime, Anywhere, Any Way Learning; Mobilizing the Millennials;" (Updated Jul 2007); http://www.k12blueprint.com/k12/blueprint/cd/CDE07_INTEL_Mobilizing_Millennials.pdf; Retrieved Oct 2009

19. Zucker, A; "One-to-One Computing Evaluation Consortium: POLICY BRIEF Starting School Laptop Programs: Lessons Learned;" (Nov 2005, Number 1); http://ubiqcomputing.org/Lessons_Learned_Brief.pdf; Retrieved Oct 2009

Web Sites, Tools and Contacts Referenced by Emerge Project Participants

1. 6+1 Traits of Writing; http://www.thetraits.org/about.php, http://www.thetraits.org/scoring_guides.php
2. Alberta Education – Emerge One-to-One Laptop Learning; http://education.alberta.ca/admin/technology/emerge-one-to-one.aspx
3. Alberta's One-to-One Wireless Learning Community of Practice; http://www.1to1alberta.ca/
4. Anytime Anywhere Learning Foundation: http://www.aalf.org/
5. Ed Coughlin (Senior Vice-President, Metiri Group, with expertise in Universal Design for Learning as well as the use of student engagement assessment tools); http://www.metiri.com/ed.html
6. Epearl (Electronic Portfolio Encouraging Active Reflective Learning); http://grover.concordia.ca/epearl/en/index.php
7. FAME (a program that logs technical requests); http://www.fameassets.com/
8. Faronics Deep Freeze; http://www.faronics.com/html/Deepfreeze.asp
9. Flip Cameras; http://www.theflip.com/
10. Gates-MacGinitie Reading Tests; http://www.sedl.org/cgi-bin/mysql/rad.cgi?searchid=177
11. iLife Tools; http://www.apple.com/ilife/
12. Jamf; http://www.jamfsoftware.com/
13. Metiri Group; www.metiri.com and http://www.metiri.com/alberta.html
14. Moodle; www.Moodle.org

15. Senteos (Student Response Device and Software); http://catalogs.infocommiq.com/avcat/CTL2328/index.cfm?mlc_id=89&prodid=470610 (For a video of Senteos in use, see http://www.youtube.com/watch?v=N5GjtBvzqK8.)
16. Survey Monkey; http://www.surveymonkey.com/
17. The Learning Bar (Survey Tools); http://www.thelearningbar.com/
18. Trend Micro ("PC-Cillin") Internet Security; http://store.trendmicro.com/store/tmamer/Content/pbPage.LandingTIS2010_enCA?gclid=CIOUhb7jpp0CFRPyDAodqTeS3A&channel=con_sem&WT_srch=1&WT_mc_id=CON14046300&ef_id=2233:3:s_d3306b0c987c81bf30bf7bfc24e7af4b_3250469824:SspbT0NIYXsAAAllgIcAAAKA:20091005204711
19. VCAlberta; http://www.vcalberta.ca
20. Voice Threads; http://voicethread.com/#home
21. Webroot Spysweeper; http://www.webroot.com/En_US/land-three-up-offer.html?rc=4929&s_kwcid=TC|9259|spysweeper||S|e|3713196950
22. Writer's Companion; http://www.writerscomp.net/, http://www.writerscomp.com/Downloads.htm

Appendix G: A Framework for One-to-One Success: EPC

The following description of Livingston's EPC Framework was excerpted from Livingston, Pamela; "1-to1 Learning: Laptop Programs That Work;" International Society for Technology in Education, Washington, DC; (2nd Edition, 2009). Practical descriptions of this framework in action are presented throughout Livingston's book.

> "The E in EPC is for **Educators**. For a laptop program to be successful, educators must be at the helm, whether they be education professors, K-12 teachers, or school administrators. Educators need to be on the front lines in the classroom, of course, but they should also take the lead in the strategy and implementation meetings in which a laptop program is planned, steered, assessed and renewed year after year. Without the E, the program won't get off the ground properly, and the tremendous potential of 1-to-1 won't be effectively realized.
>
> The P is for **Planning**, which is often the area given the shortest shrift. Considerable planning needs to happen before a single laptop is purchased. Jumping on the laptop bandwagon without a clear idea of where that wagon is heading will result in frustration at the very least, and total chaos and failure if you're really unlucky.
>
> C represents **Commitment**. Educators need to be committed to the success of the overall program and do their part to make it happen. This commitment means believing in the results even though challenges will arise and time-honored habits and traditions will change. To be successful, all stakeholders must be equally committed to providing their piece of the laptop puzzle: hardware, software, network infrastructure, logistics, professional development and classroom implementation." (pp. 19-20)

Appendix H: Mobilizing the Millennials: Blueprint for Action

The following blueprint component descriptions were excerpted from "Mobilizing the Millennials: *Ubiquitous Computing Enables Anytime, Anywhere, Any Way Learning*" (2007).The authors' rubric, which outlines the early, developing, advanced and target levels for each component of the blueprint for one-to-one laptop learning follows (see Chart 1 below).

Descriptions of Blueprint Components

"**Leadership**: Implementing a one-to-one initiative requires extensive planning, goal setting and systemic change. Building a school system based on School Performance Management Systems that use data to increase academic achievement requires policy development, ongoing communication and especially a visionary leader to champion the cause. A structured change management approach toward ubiquitous computing enables systemic change – changing entire school systems, not just school districts.

Funding: Funding methods for a one-to-one program can be challenging; therefore, seek creative approaches to traditional and outside sources. Add a budget for long-term sustainability and scale.

Infrastructure and Architecture: From hardware and software to connectivity, this component includes such factors as policy (use, refresh rates, equipment replacement and so on), security and technical support.

Curriculum: From textbooks to Internet and courseware options, developing content-neutral management systems must meet the needs of 21st century learning. Courseware options should draw heavily upon rich digital content.

Professional Development: PD management and implementation based on individual assessments must begin early in the process and be ongoing for teachers, administrators and staff.

Resources and Results: Progressing toward learning objectives requires data collection, data coaching and modeling based on other successful programs and ultimately developing methodology for measuring results from your one-to-one initiative, be it student, class, teacher, administrators or the entire school district.

Policy: Policy provides the foundation that enables planning to take place. The test of a successful policy is in the examination of the program accomplishments to determine whether the intended beneficiaries are truly profiting from the policy; and a judgment about the fairness of the policy to all parties it affects." (Proposition 4, pp. 7)

Chart 1: Blueprint Components Rubric

Stages → Example Ratios Students: computer	**Early (Starting) Technology** School Station 20:1	**Developing Technology** Labs 10:1	**Advanced (Prepared) Technology** In Classroom 5:1	**Target One-to-One Computing** Personal 1:1
Leadership	• Create vision • Look at strategies and options • Build a task force	• Adoption of a data-driven decision-making system for essential reports needed by administrators, principals, teachers, students and parents • Plan and set goals • Ensure ongoing communications with stakeholders	• Develop strategic technology plan and implementation plan	• Plan implemented • Easy access to information and resources • Policy created
Funding	• Distinct funding sources-not focused specifically on technology	• Limited availability • Competing demands	• Funding sources focused on technology	• Seek underwriting • Creative sources
Infrastructure and Architecture	• School Performance Management System • Basic school administration-/computerization • Limited network	• IT Learning • Labs connected	• IT-enhanced Learning • All classrooms connected with teacher's computer • Few students connected	• Provides anytime, anywhere eLearning • Each student/teacher has a computer • Policy in place for security and technical support • Consistent access at home and school
Content-Neutral Curriculum Solution	• Textbook only • Evaluate textbooks	• Textbook/Internet (some Web resources) • Introduce courseware	• Textbook/Internet Courseware • Re-allocate textbook budget to courseware licenses	• Courseware/Internet/ Textbook • Courseware for curriculum, modern apps for alerts and administration • Use eTextbooks • Rich digital content necessary for individualized learning
Professional Development	• Consistent individual training, usually off-site	• Provide training according to initiative plans • Provide basic computer skills training (Microsoft Office, etc)	• Train IT team • Teachers receive computers well in advance of one-to-one • Base instructional competency on instructional goals	• Ongoing professional development for teachers, staff and administrators • Results in increased instructional proficiency • Full instructional integration • Enables systemic change • District manages professional development plans
Resources and Results	• Program created in a vacuum, not looking at other sources	• Research other one-to-one programs	• Model policy funding structures, and infrastructure on other successful programs	• Evaluate and demonstrate successes • Data-drive decisions • Become model program
Policy	• Policy is a first step in the process	• Computer use on an occasional experimental basis	• Computer use on an occasional experimental basis	• Direction should be toward a systemic technology immersion • Policy should be constantly evaluated and modified as needed in order to be the most beneficial • Evaluation enables the process to be checked continually for adherence to the stated goals and objectives • Systemic immersion for all participants (teachers, administration and students) in technology and professional development

Appendix I: NEIRTEC: Lessons Learned About Providing Laptops to All Students

The following summary of learned lessons was excerpted from NEIRTEC's "Lessons Learned About Providing Laptops for Students" (2004). See http://www.neirtec.org/laptop/LaptopLessonsRprt.pdf for more details.

Planning

- Align the laptop initiative with your goals (focus on key goals for student learning; align your tech policies and supports with your goals).
- Build a strong leadership team at all levels (meet on a regular basis).
- Think about funding for the long term (use outside funds when possible).
- Develop solid partnerships both inside and outside the school system (take into account stakeholders' level of interest in the one-to-one initiative and demonstrate success early; develop business partnerships and partnerships with evaluators).
- Plan logistical details carefully (help protect the computers, set up filters and other control mechanisms for laptops, design systems for distribution and daily mgt).

Training and Mgt

- Provide training and professional development for teachers, administrators primarily on curriculum integration, not just technical skills (assess tech and pd needs of school staff; form a tech leadership team; use a variety of training and PD formats; partner with local universities, education organizations and other institutions; provide administrator pd; make pd flexible).
- Train parents on basic technical skills and inform them about the codes of conduct and rules involved (establish a training requirement for parents; create a parent resource centre).

Hardware and Software

- Provide necessary digital content and tools (purchase or license digital materials; create e-learning curriculum writing teams; identify software needs and restrictions).
- Build and maintain the necessary network architecture (assess the infrastructure and wiring needs within the school; support and maintain networks, consider purchasing display devices).
- Make technology support available onsite as well as offsite (have onsite technical assistance available; establish clear procedures to address major technical needs offsite; create a student-run help desk).

Managing Change

- Allow sufficient time for change and make it gradual (allow time for teachers to become comfortable with technology before expecting them to use it for instruction; provide students with keyboarding skills; expect change to be gradual).
- Foster and maintain stakeholder participation and ongoing communication (use various approaches to reach out to the broad community; involve students).

Monitoring and Evaluation

- Make monitoring ongoing.
- Conduct research or evaluation studies (look for critical influences at multiple levels of the education system.
- Figure out what you're especially trying to teach and measure that.
- Look for ways to evaluate the long term costs and benefits of the tech infrastructure.
- Let the research question drive the choice of method.

Appendix J: Sample Acceptable Use Agreement – Chinook's Edge School Division

CHINOOK'S EDGE SCHOOL DIVISION

Emerge 1:1 Mobile Computing Pilot

APPROPRIATE USE AGREEMENT AND PERMISSION FORM

Chinook's Edge School Division and _____ is pleased to offer your child access to a mobile laptop computer and computer network for home and school use during the 2007-08 school year. This is possible through our participation in the **Emerge 1:1 Mobile Computing Pilot** sponsored by Alberta Education.

This computer remains the property of Chinook's Edge School Division and must be returned to _____ upon request.

In order to use and access a designated laptop, email, and the internet, all students involved must obtain parental permission as verified by the signatures on the form to follow.

What is possible?

- Access to and utilization of a mobile laptop computer, for school and home use, will be an integral part of the Emerge 1:1 Mobile Computing Pilot for the participating group. By participating in this project, we believe students will enrich their 21st century skills within and extending beyond the classroom.
- Access to email and the Internet, at school and home, will enable students to explore thousands of libraries, databases, museums, and other repositories of information and to exchange personal communication with other Internet users around the world. This will foster a collaborative learning environment enriched through resources provided through the mobile technology.
- Families should be aware that some material accessible via the Internet may contain items that are illegal, defamatory, inaccurate or potentially offensive. While the purpose is to use Internet resources for constructive educational goals, students may find ways to access other materials. We believe that the benefits to students from access to the Internet exceed the disadvantages.
- Ultimately, parents and guardians of minors are responsible for setting and conveying the standards that their children should follow when using media and information sources.

Declaration of Use

As a student in the **Emerge 1:1 Mobile Computing Pilot** at _____, I value having a laptop assigned to me. I know that along with this privilege goes great responsibility. To demonstrate my commitment and understanding of the level of responsibility that is required, I have initialed each of the expectations and guidelines below. (Note: each item must be initialed by the student and his/her parent/guardian to show that together they have reviewed each item and the student will abide by the rules and expectations laid out for technology use.)

Student's Initials	Parent's Initials	
		I understand that having access and use of an assigned laptop is a privilege and that this privilege may be revoked if I fail to fulfill my responsibilities as a user of this technology.
		I understand that I am responsible for appropriate behavior on the provided laptops at ALL times and in ALL locations. I understand that violations of appropriate use include: • Cyber-Bullying (see attached) • Cyber-Threats (see attached) • Infringement on Copyright Laws • Viewing of inappropriate material • Social networking during classroom times (e.g. MSN)
		I am aware that my activity using any technology assigned to me will be monitored and may be viewed by the teacher or other appropriate personnel.
		When connected to the Internet I will **NEVER** distribute personal and private information such as my age, address or phone number, or those of other students or persons.
		I will respect the privacy of another person's mobile computer, folders, work and files.
		I will not share ANY passwords or access codes associated with my laptop with anyone except my teacher or parents when requested. I will not use the account of another student or teacher.
		I will not download or install any software, music, video or files unless, I have been granted permission by my teacher.
		I understand that information found on the Internet is often inaccurate or incomplete.
		I understand that I may personalize my laptop in a manner that is **SCHOOL APPROPRIATE** and **TEMPORARY**.
		I understand that my actions using the computer and accessing the Internet reflect on me, my class, the school, and my parents. I will conduct myself accordingly and exercise good judgment.
		I understand that my parent/guardian is responsible for my behavior and conduct while using the laptop and Internet.
		I will respect the rules set out here and those that may come into effect in the future regarding use of the laptop computers both at school and at home.

USER AGREEMENT

As a user of the mobile laptop and a participant in the Emerge 1:1 Initiative, I agree to comply with the above stated rules and to use the laptop, peripherals, and network in a positive and constructive manner.

Student Name (print clearly): _____

Student Signature: _____

Date: _____

PARENT PERMISSION FORM

As a parent or guardian of a student at _____ and participant in the Emerge 1:1 Initiative, I have read the above information about the appropriate use of mobile computers at the school and home and I understand this agreement will be kept on file at the school. I understand that is impossible for Chinook's Edge School Division to restrict access to all unacceptable materials and I will not hold the school or the division responsible for materials acquired on the Internet.

Upon my child's completion or withdrawal from the Emerge 1:1 Initiative, all technologies must be returned in reasonable working order to Chinook's Edge School Division. Failure to do so may result in my paying appropriate financial compensation.

I, _____, agree to the terms and

Parent Name (print clearly)

conditions previously stated and grant my child, _____,

Student Name (print clearly)

permission to participate in the Emerge 1:1 Initiative and obtain access to the school network through the use of a mobile computer.

Parent's Signature:_____

Date:_____

Appendix K: Sample Project Charter – Rocky View School Division

Author

Author:	Kevin Wttewaall	**Version:**	0.1
Phone:	(403) 945 4024	**Date:**	March 27, 2007
File:	RVSD Project Charter Template.doc	**Status:**	Draft

Document Control

Project Name:	UDL - Breaking Down the Barriers to Learning		
Service	Technology Services		
Project Number:	0008		
Document Subtitle:	Project Charter		
File Location:			
Electronic Filename:	UDL Breaking Down the Barriors.Doc	**Last Updated:**	
Current Version:	0.1	**Current Status:**	Draft
Document Owner:	-New-	**Phone:**	(403) 945 4024

History

Version	Date	Author	Description
0.1	March 27, 2007	Kevin Wttewaall	Initial Draft of Charter

Project Charter

Project Identification	
Project Name:	UDL – Breaking Down the Barriers to Learning
Current Name Phase:	Charter
Project Sponsor: COE RVSD	Greg Bass
Division Functional Associate Superintendants:	Murray Besenski & Dr David Peat
Project Manager:	Kevin Wttewaall

Initiative Description

Participants

Target Groups: Grade 6, 7, 8 This three year longitudinal study is to commence in the fall of 2007 initially involving all grade 6 students in three schools.

- W G Murdoch School (6-12) with 58 grade 6 students. Cohort identified as having a wide range of learning and intellectual abilities including those identified with Learning Disabilities, and children diagnosed with Autism Spectrum Disorder (ASD). As well, the population has less economic advantages than urban learners.

- Langdon School (K-8) has 60 grade 6 students + 15 students at Indus School for a total of 75 students. The School profile is representative of all learners including those with disabilities (LD, FAS, language difficulties and ASD) and First Nation's children. This is a mid-socioeconomic cohort of rural learners in a school experienced with laptop learning.
- Indus School is part of the Langdon School study cohort as their grade 6 students transfer to Langdon for grades 7 & 8. Therefore, Indus grade 6 students will be included so that they can participate in the study for the three full years.

These schools have been chosen because they include learners with a diversity of learning needs, are small rural schools, and have school administrations very supportive of teaching and learning with technology in general and of this initiative in particular.

Alignment with educators' and learners' needs and existing research

The "Breaking Down the Barriers" proposal is based upon the Universal Design for Learning (UDL) framework which develops a technology rich learning environment that enables every student, including those with special needs, to move towards maximizing their learning. . Through this applied research project, RVSD would like to build upon the various instructional approaches currently operating in its schools and consistent with the principles of UDLwork toward improving learning for all students.

UDL is a model that guides the creation of a learning environment that is inclusive of every student and utilizes appropriate teaching methodologies and digital technologies. This model, developed by one of the research leaders in the area, the Center for Applied Special Technology (CAST), has been increasingly implemented in progressive school systems striving to meet the needs of all learners. The principles of UDL state that:

- Students with disabilities fall along a continuum of learner differences, just as other students do;
- Teachers should (and many do) make adjustments for all students, including those with disabilities;
- Curriculum materials should be as varied and diverse as the learning styles and the needs in the classroom; and
- Curriculum, activities, assessment and strategies should be flexible to accommodate a range of student differences.

This research initiative is widely supported by the departments, schools, educators and communities involved. In the initial design of the research project several factors have been considered including the identification of:

- *School populations with a diverse range of learners,*
- *Schools with strong technology leadership, and*
- *Schools with community support*

The one-to-one laptop initiative will provide students with the opportunities to utilize multiple forms of resources, assessment and representation in order to explore a variety of literacies and experience success in a 21st century learning environment.

Vision and educational goals and priorities

RVSD plans to meet the educational goals of **all** students by differentiating teaching and learning, and by employing student-centered instruction and technological innovations. These initiatives are led by a strong cross-departmental team committed to improving learning for all students, demonstrating and sharing best practices and supporting practice through research. One of the key goals of this initiative is to expand learning opportunities for all students, especially those with disabilities. What is learned through this research project has the potential to positively impact the teaching practices and learning outcomes throughout the division. The sharing and implementation of these enhanced practices has the ability to be sustained and institutionalized.

The vision behind this proposal is to design and provide access to a one-to-one computing program for grade 6 learners in three schools and follow these learners for 3 years, in order to evaluate and assess the impact that ubiquitous access to mobile technologies, supportive online tools and focused professional development have on the educational success of every student.

Goals and Objectives

- To determine the differential learning, motivational and behavioral effects on students over three years when one-to-one mobile computing is implemented with a diverse student population in inclusive classroom settings.
- To determine the essential components equired in the three schools to implement UDL through one-to-one mobile computing.
- To identify the functional specifications needed for successful implementation of student laptops in an educational context.
- To determine the demands on technical support in terms of time and type of support.
- To determine the limits and abilities of wireless technologies in a laptop environment.
- To determine changes in teacher practice brought about by the use of technology.
- To determine the sustainable and effective PD strategies that emerge from the initiative?
- To determine the impact on teacher practice through working within an online community of practice in support of learners.
- To determine the impact of technology on learner experience
- To determine teachers' perceptions of professional development regarding use of various technologies and applications.

Critical Success Factors

The purpose of the UDL Breaking Down the Barriers Project is to describe the impact on learners in three different school settings where technology is ubiquitous and students are able to access digital tools and learning resources on-demand. This project is designed to examine the potential for one-to-one computing to answer the following questions:

- How are learning outcomes affected when learners have 24/7 access to universally designed lessons using curriculum matched high quality multimedia resources through mobile computing at home and at school?
- What are the impacts on outcomes for 'at risk learners' (e.g., ESL, Métis, High LD Mild cognitive deficit) as compared to other learners?
- What is the impact on learning outcomes when the barriers to learning are removed by designing lessons that follow a UDL model?

Critical success factors will

- Be determined by assessing the value of digitized and online learning resources to support learners as they progress from grades 6 to 9;
- Inform current practice regarding student experiences with digitized learning resources–both laptop and studio resources;
- Help describe the role of educators working with both technical and learning resources;
- Help to identify opportunities for teacher practice and professional development; and
- Help to identify needs for learner support, access and resourcing.

Key Results/Deliverables

1. Deliver a one-to-one mobile computing program that will:
   a. provide students in grade 6 and their teachers at 3 sites with access to laptop computers at school and at home;
   b. implement Universal Design for Learning (UDL) to increase the diversity in teaching presentation styles and to differentiate learning for students;
   c. provide teachers and students with access to assistive technologies that target a variety of learning needs;
   d. provide learning activities and access to multimedia resources, for student attainment of 21st century skills;
   e. deliver both technical and pedagogical professional development to support the implementation of one-to-one mobile computing;

f. conduct program evaluations utilizing progress reports, student/staff surveys, teaching artifacts, classroom and high stakes assessments and student work samples;
g. establish a wireless network infrastructure throughout the participating schools; and
h. communicate and consult with the community through the project website, newsletters and status reports.

2. Share information (merits, challenges, promising practices) related to the one-to-one mobile computing initiative at a minimum of one stakeholder event, to be determined in consultation with Alberta Education.
3. Participate in Research Community of Practice activities supported by Alberta Education. Participation may include, but is not limited to:
   a. using a common toolkit;
   b. attending provincial meetings and events;
   c. contributing to an online Community of Practice environment;
   d. participating in research activities which may include:
      i. interviews,
      ii. focus groups; and
      iii. observations.
4. Provide one status report, by June 30, 2007 and two interim reports to Alberta Education on or before October 31, 2008 and October 31, 2009. Templates will be provided. Interim reports must include a short video (max. 10 minutes) showcasing the project and project outcomes;
5. Provide a final report on the project to Alberta Education on or before October 31, 2010, which will include the following:
   a. Impact statement describing the benefits that have resulted from the initiative;
   b. Assessment of the extent to which the goals and deliverables have been met as identified in the attached proposal;
   c. Recommendations based on lessons learned;
   d. Plan for long-term sustainability;
   e. A short video (max. 10 minutes) showcasing the project and project outcomes; and
   f. Other information as deemed appropriate by the Grant recipient.

Project Delivery Strategy

1. Professional Development

At the beginning of the project, all anticipated project teachers for the three year project will be assigned a laptop and trained on its use. Any new teacher entering the project after the initial training period will be required to complete an in-house technical training workshop. This technical training will include, teaching laptop management processes, OS and application training. The ICT Coordinator and Student Services Program Specialist will work with project teachers to create learner-centred activities and teaching units appropriate for Laptop learning. The Plone CofP will be used to for teachers and students to facilitate Blogging file sharing and collaboration. Web Logic will be used for learners and parents to track assignments, assessment data and attendance. Elluminate sessions will be coordinated for synchronous/archived PD and instruction. A one-to-one Community of Practice will be established and will work toward providing best practices and resource strategies to support our understanding of UDL and the impact of mobile technology on student learning. Ongoing PD opportunities that are in alignment with the needs identified will assist teachers to become more confident in their implementation of technology.

Professional Development	Best Practices/Implementation
Technology use	• Professional Development provided to all staff directly involved with the project beginning 6 months prior to commencement. This would include those staff members who will not be involved until the final year of the project. • Inclusion of a technology mentor at the Division level.

	• Implementation of technologies by staff when working, designing, conferencing, or planning. • Ongoing professional development in the area of "Technology Use" to keep staff informed on changes to use and implementation of current technologies. • Introduction of available technologies that will compliment the delivery of core curriculum.
Curricular connections	• Professional development for staff in the areas of Universal Design for Learning, differentiation, "Understanding by Design", "21st century skills" and "multiple intelligences" • Integrating technology into the curriculum using the aforementioned strategies • Align with current AISI project (Clear Targets)
Creating Community	• Providing parents/teachers/students an opportunity to become "technologically aware". Providing "stakeholder" Professional Development • Creating an online collaborative community that can be accessed by all stakeholders • Examining school culture surrounding technology use and implementation

2. 21st Century Skills

The Partnership for 21st Century Skills and Barrios' report (Barrios, Tina, et.al.; p 56) identify six critical elements for 21st century learning:

1. Emphasize core subjects.
2. Emphasize learning skills including information and communication skills, thinking and problem-solving skills, interpersonal and self-directional skills.
3. Use tools including computers, information and communication technologies, audio, video and other multimedia tools.
4. Create authentic learning environments that make content relevant to students (take students out into the world and bring the world into the classroom), create opportunities for interaction with others (teachers, students, experts) within and beyond the school.
5. Raise global awareness and increase financial, economic, civic and business literacy.
6. Balance and strengthen standardized and classroom assessments to ensure that they measure the full range of core subject outcomes as well as outcomes associated with 21st century skills in a timely way.

We strongly believe that the one-to-one mobile learning initiative will help create a culture where the seamless integration of technology with curriculum will provide a rich information and communications learning environment with a high level of success and acceptance by learners, educators, and the community. Not only will our students benefit, but our teachers will be engaged in a professional learning environment that will allow them to further develop and model their own critical thinking and communication skills and professional practice.

3. Curriculum and technology and use of multimedia resources and software

Teachers, with the support of the rest of the project team, will design learning activities following the Universal Design for Learning (UDL) model to ensure engagement and learning opportunities for every student regardless of ability: an inclusive classroom. One-to-one laptops will provide an essential tool for UDL to be fully implemented for every student. The focus will be on the Digital Age Literacies, Inventive Thinking, Effective Communication and High Productivity as outlined in the document: enGauge 21st Century Skills, Metiri Group. Strategies will include using the Understanding by Design framework to develop units of study that provide a formative assessment portfolio representing multiple literacies, encouraging an inquiry approach to learning, infusing technology in a constructivist nature that engages critical or creative thinking and integrating multimedia resources from a variety of sources such as LearnAlberta.ca,

The primary support role will be the responsibility of the ICT Curriculum Coordinator: .4 FTE will be in support of the one-to-one laptop project. Student Services will provide support to ensure an inclusive classroom environment. Their commitment is 0.2 FTE, over and above support services that are already institutionalized.

The Curriculum and & Instruction Support (CalS) team will be called upon when required to provide curricular support in planning units of study.

4. Network architecture, security measures, hardware and software

A distributed wireless antenna network providing connectivity in the local area network, which is further connected to the RVSD WAN, serves the instructional environment. The WAN, provisioned by SuperNet, provides access to specific central resources (web environment, online learning environment) and the Internet. Wired LAN access is also provisioned in the school for print and server, and would serve as backup connectivity for laptops to the wireless environment.

5. Technical support

RVSD regularly provides onsite and remote technical support for school-based technologies through School Technology Support, the Help Desk and Network Services departments. Due to the additional laptops in this project, bringing the ratio to 1:1, additional technical support is contemplated. RVSD will ensure that Technical Staff are trained in the support of the provided technologies

6. Strategies for community consultation, collaboration and communication

In an initiative such as the One-to-One Mobile Computing initiative, community consultation, collaboration and communication are critical to its success. Ensuring the involvement of key stakeholders in the design, development, implementation and evaluation of the initiative will be accomplished in a variety of ways.

Initially, the school Tech Services will be involved through presentations that will explain the initiative to be undertaken by the schools.

Parent meetings will then be held as their support will be paramount to the success of the students. These meetings will involve the parents actually working on computers and accessing some of the learning that their children will be involved in. The hands-on approach will assist parents in better understanding some of the technology that their children will be using. During these meetings, parents will be given "Acceptable Use Policy", "Computer Insurance" and "Parental Permission" forms to sign. Completion of these forms will be one of the requirements that will allow their child to participate in the program.

As the initiative proceeds, key stakeholders will be involved in focus groups, on-line and paper surveys and planning sessions. These will be used to evaluate the initiative over the three years.

Evaluation Plan

Evaluation and Reporting

Theoretically, the implementation of UDL using one-to-one computing technology should lead to improvements in academic performance, increased student motivation, and increased competency, 'comfort' and utilization of technology.

Both qualitative and quantitative data will be collected throughout the study. Baseline data will be collected at the beginning of the study, and post-test data at the end of each school year, for three consecutive years. As well, qualitative data will be collected from both experimental and matched control groups (class level) through focus-group discussions, interviews and structured questionnaires.

Qualitative Baseline Data

- Teachers will be surveyed concerning their comfort with technology, teaching in general, change in teaching practice, and toward integration of special needs children
- Student surveys/formal instruments will address attitude toward learning, familiarity with technologies, buy-in to relevancy of schooling, learning styles (Make School Work for You, Alberta Education), social emotional development and well being (behavioral incidents reported)
- focus-group discussions with groups/individuals
- Parents will be surveyed regarding their attitudes toward the use of technology as a teaching/learning tool

Quantitative Data

- Report card marks will be used to evaluate improvement in students' performance

- For students with special needs, Current Level Of Performance on their IPPs, will be used to ascertain the students' current level of functioning and their academic needs
- PAT results will be compared to outcomes of other schools in division
- Rubrics will be used to evaluate student and teacher skills with hardware and software

In order to identify children falling within the categories of LD, Average or Gifted, group-tests (i.e.,CCAT and CTBS) will be used. Motivational as well as technical background experience questionnaires will be administered at the same test points.

In addition, the effects of participating in the study for particular students with more pronounced disabilities such as Multiple Sclerosis, Cerebral Palsy, Blindness, Hard-of-Hearing, or Developmental Coordination Disorder will be investigated following N=1 Methodology.

Evaluation and reporting will meet the requirements of Alberta Education.

(These initial ideas will be "fleshed-out" and concretized with the assistance of the researcher contracted through Alberta Education.)

Outcomes	Measures
Improving learner outcomes	Standardized assessments (CCAT & CTBS) and Provincial Achievement Tests (PATs) will be used to establish an achievement baseline. GLA will provide an ongoing reflection of assessment throughout the 3 years. Ongoing classroom-based assessment and portfolio assessment will be used to document student progress. Grade nine PATs will be used one year beyond the study to evaluate sustainability of student achievement.
Attitude toward learning	Student and parent surveys and focus groups to assess attitudes towards learning. May 07 – 08 – 09 - 10
Essential components to implement UDL through one-to-one mobile computing.	Examine the artifacts of teaching and learning strategies and resources Examine artifacts of student learning. Examine change of teacher practice through Surveys, observation, focus groups, journaling - blogging, Community website
Sustainable and effective PD strategies	Growth in teacher practice, cost and time effectiveness of PD activities. Participant feedback from PD strategies.
Status Reports	Project status reports to the steering committee will be made on a regular basis. Other stakeholders such as the community and Alberta Education will be delivered on June 30, 2007, August 31, 2008 and August 31, 2009. A final report will be prior to August 31, 2010.

Scope

[Carefully define what is included in and excluded from the project work.]

Scope Includes	*Scope Excludes*

Key Stakeholders

Planning/Initiative Team Members

Project Team Members/ Role	Time Devoted to Project	Experience	Planned Contributions
Kevin Wttewaall – Supervisor of Technology Services, Role: Initiative Lead, report author	Initiative management, Leading Technology Services Department 4 hours/week	Partner and lead in various government funding projects (Canarie, Heritage Canada, and AISI), JTC, Served on two Alberta Education Technology Standards Committees. Works extensively with technology enhanced learning strategies and professional development. Project managed various jurisdictional ICT projects as well as technology infrastructure projects. Teacher	In-kind
Murray Besenski – Associate Superintendent Program Services Role: Steering Committee member, Curriculum and Technology Services lead	Providing leadership to Schools, Curriculum and Technology Program Services Units 1 hour/week	Associate Superintendent of Schools and Program Services. Considerable experience providing system leadership in the area of curriculum and technology and schools.	In-kind
Dr David Peat – Associate Superintendent Learning Support Services, Role: Student Assessment lead, Steering Committee member	Providing leadership to Student Services Department Developing Research methodology 1 hour/week	Associate Superintendent of Schools and Learning Support Services. Extensive experience in designing and implementing instructional approaches that allow districts, schools and teachers to accommodate students with a wide range of learning needs. Past Associate Researcher for the Cognitive Education Project, a large, field–based project of Alberta Education, University of Alberta and multiple school jurisdictions. Author, University Instructor, Psychologist, Teacher Educator.	In-kind
Wes Oginski Supervisor of Curriculum Services Role: Steering Committee member, Curriculum support for educators	Project Steering committee member, Supervisor of Curriculum and Instruction Department 2 hours/week	Develop and supervise division AISI projects, support curriculum and instruction initiatives, jurisdiction representative to Alberta Assessment Consortia, collaborate in development of Calgary Regional Consortium programs, and initiated mobile technologies project proposal.	In-kind
Todd Kiernan Principal of Alternative Learning Services – Role: Steering Committee member, PD support for educators	E-Learning professional development for staff Provision and support of various technology tools for the project	Teacher Grades 1 – 12 Online Teacher Jurisdiction Technology Chair Online Administrator past 9 years. Chair – Alberta Online Consortium Certificate of eLearning Management (in	In-kind

Project Team Members/ Role	Time Devoted to Project	Experience	Planned Contributions
	4 hours/week	progress)	
Dawn Rife Program Specialist, Student Services Role: Steering Committee member/field-based consultation, Assistive/Adaptive Technologies lead	Minimum of 0.2 FTE providing professional development for school staff, including the integration of technological adaptations and/or assistive technology into IPPs. Dawn and her team will also be collecting data and working with others to design research instruments, conduct analysis and evaluation.	Extensive experience working with staff to develop effective programs for students with special needs. Project Manager for RVSD's web-based IPPSystem. Recently completed Basic Competency certificate in Assistive Technologies through the US National Association of State Directors' of Special Education.	In-kind
Barry Allen ICT Coordinator Role: Steering Committee member and Technical Support, interim report author	Minimum of 0.40 FTE devoted to the site-based implementation, direction, management and leadership of this project.	Experience leading system technology projects, many years as regional consortium PD provider	In-kind
2007/08 Teachers **Murdoch School** Chris Barrett Lynne Dickie Pat Farley **Langdon School** Josh Hill Linda Smith Chelsey Bird **Indus School** Kim Hart Chael Wyper 2008/09 Gr 8 Teachers TBA 2009/10 Gr 9 Teachers TBA Role: Teach Design and Implementation	5.0 FTE / year devoted to the site-based implementation, direction, management and leadership of this project.	Educators will require experience and interest in supporting colleagues	Project funded professional development ; In-kind - Salaries
Jean Kruse Principal of Murdoch School, Steering Committee member and on-site program director and implementation lead.	School Based Administrator supporting and leading staff involved in initiative 1 hour/week	Educator, school administrator skilled at leading education and technology projects.	In-kind
Scott Mahan Assistant Principal of	School Based Administrator supporting and leading staff	Educator, school administrator skilled at leading education and technology projects.	In-kind

Project Team Members/ Role	Time Devoted to Project	Experience	Planned Contributions
Langdon School, Steering Committee member and on-site program director and implementation lead.	involved in initiative 1 hour/week		
Chael Wyper Principal of Indus School Steering Committee member and on-site program director and implementation lead.	School Based Administrator supporting and leading staff involved in initiative 1 hour/week	Educator, school administrator skilled at leading education and technology projects.	In-kind

Organizations Impacted

Organization
Indus Elementary School
Langdon Middle School
Murdoch School
Education Centre
Alberta Education

Estimated Schedule and Budget

Legend

	Project Meetings		TECH SERVICES supported Professional Development
	School Support Team Research		IT supported work and documentation
	Vendor Supported Professional Development		Community of Practice Work
	PM Deliverables		

Activity Timeline

Activity	Date	Achieved
Kickoff Steering Committee Meeting	April 4, 2007	
Development of 1-1 Community of Practice	April 2007 Ongoing	
Initial meeting of participating teachers	April 2007	
Initial 1-1 Community of Practice meeting (Edmonton)	April 23rd 2007	
Pre-assessment survey	May 2007	
Support from Vendor to provide expertise in the use of Laptops as a pedagogical tool for learners, to work with subject area specialists who have defined pedagogical content for literacy/communications	May 2007 – December 2007	
Initial UDL Workshop	May 2007	
School Focus Group	May, 2007	
Laptop Workshop	June, 2007	
Tech Services orientation for teachers to Digital Learning Resources	May 23 2007	
Using Plone to support Classroom learning Workshop	May 23 2007	
Initial Status Report due	June 30th 2007	
Purchase of 156 Laptops, carts, projectors, printers	August 15, 2007	
Meeting with Steering committee	August 31, 2007	
Deploy equipment to schools – tech support to configure laptops	September 2007	
Research Information sent to grade 6 teachers	September 1, 2007	
UDL workshop for grade 6 teachers	September 14, 2007	
PD in-services – Laptop Resources –	September 14	
Tech Services workshop – School to home Laptop care and management	October 2007	
School Support Team Action Research support– within schools and classrooms	September 2007 – May 2008	
PD in-services – Vendor- School Visits	September, 2007	
Steering Committee Meeting	September 28, 2007	
Identify grade 6 students for 3-year study.	October, 2007	
Ethics Approval – finalize and administer consent forms	October 14, 2007	
Pre survey – students – phase 1	October 2007	
Follow Up Action Research workshops	October 18 and 19	
Pre focus group interview with participating teachers – phase 1	October 18,19, 2007	

Activity	Date	Achieved
Wireless Network instillation or upgrade complete	October 2007	
Deploy laptops to schools – tech support to configure laptops	September 2007	
Technical and functional requirements documentation	October, 2007-May, 2008	
Distribute forms/start collecting data on implementation and usage handing in twice a month	November, 2007-May 2008	
PD in-services – Vendor - School Visits	October 25, 26, 27, 2007	
Workshops/ one on one assistance - Tech Services	Ongoing 2007 - 2010	
Continued Support for Action Research and Communities of Practice	October, 2007 – May, 2010	
Communities of Practice ongoing meetings	October 2007 - June 2010	
Steering Committee Meeting	October 25, 2007	
	November 8, 2007	
Steering Committee Meeting	November 9, 2007	
Airport base stations delivered to TECH SERVICES	November 9, 2007	
Deploy laptops to schools – tech support to configure laptops	November 2007	
PD in-services – Vendcr- School Visits	November 29, 30 December 1	
Configure laptops for wireless Indus	September 2007	
Configure laptops for wireless Langdon	September 2007	
Configure laptops for wireless Murdoch	September 2007	
PD in-service - TECH SERVICES	March 1, 2008	
	March 2, 2008	
PD in-service - TECH SERVICES	March 7, 2008	
PD in-service - TECH SERVICES	March 9, 2008	
PD in-service – Vendor- TECH SERVICES	March 14, 2008	
Post survey – Parents Year 1	May 2008	
Post survey students – Year 1	May 2008	
Post Survey – Community of Practice participants Year 1	May 2008	
Focus group interviews with participating grade 6 teachers	May 2008	
Complete final report and findings	May 2008	

Activity	Date	Achieved
Steering Committee Meeting – first year report, evaluation of project plan and implementation Establish planning for year 2	June 23, 2008	
New teacher Orientation	September 21,2008	
Pre survey – students – phase 2	October 2008	
Status Report Due	October 30, 2008	
Post survey – Parents Year 1	May 2008	
Post survey students – Year 1	May 2008	
Post Survey – Community of Practice participants Year 1	May 2008	
Focus group interviews with participating grade 6 teachers	May 2008	
Status Report Due	October 30, 2009	
Post survey - Parents	May 2010	
Post survey – students - phase 2	May 2010	
Post Survey – Community of Practice participants	May 2010	
Final report Due	October 31, 2010	

Detailed Budget

Budget			Alberta Education Funding	Jurisdiction In-kind Contribution
Personnel	**FTE**	**Cost/Unit**	**Subtotal:**	**Subtotal**
Murdoch School Teachers Gd 6 07/08 Gd 7 08/09 Gd 8 09/10	2 FTE/ year 2007 to 2010	$77,750.00		$466,500.00
Langdon School Teachers Gd 6 07/08 Gd 7 08/09 Gd 8 09/10	3 FTE 2007 to 2010	$77,750.00		$699,750.00
Indus School Teachers Gd 6 07/08	1 FTE 2007/08	$77,750.00		$77,750.00
Technical Support - Laptop setup and maintenance	0.2 FTE/3yr	$10,000.00/yr		$30,000.00
Professional Development and/or technical training w/assoc costs	**Units**	**Cost/Unit**	**Subtotal:**	**Subtotal**
Participation in Community of Practice	3 Years	$10,000.00	$30,000.00	$0.00
Professional Development Release time – substitute coverage during PD activities	3 Years	$16,666.00	$35,000.00	
ICT Coordinator – Ongoing planning of learning activities and assessment with project teachers	0.4 FTE/3yr	$32,700.00		$98,100.00
Program Specialist ; provide special needs learning strategy support for	0.2 FTE/3yr	$16,250.00		$49,050.00

Budget			Alberta Education Funding	Jurisdiction In-kind Contribution
teachers				
Equipment/Technology	**No. Units**	**Cost/Unit**	**Subtotal:**	**Subtotal**
Laptops	156	$1249.00	$194844.00	
LCD projectors	6	$1000.00	$6,000.00	
Laptop Storage Carts	7	$1761.00	$12,356.00	
Laptop Bags	120	$20.00	$2,400.00	
Wireless Network AP's	10	$800.00	$8,000.00	
Printers	8	$300.00	$1400.00	
Software Resources	**Unit**	**Cost/Unit**	**Subtotal:**	**Subtotal**
Mind Map Software(Inspiration)	160	$49.00	$7840.00	
Accessibility Software (RW Gold – Dragon natural speaking	10	$500.00	$5000.00	
Eluminate Software	40 seats			$10,000.00
Plone	1 server	$6000.00		$6000.00
D2L				$15,0000.00
Virus Protection	160	$49.00		$7800.00
Miscellaneous	**Unit**	**Cost/Unit**	**Subtotal:**	**Subtotal**
Network Switches and Wiring	3	$1200.00		$3600.00
School Network Server	3	$6000.00		$18,000.00
Cabling and Power for AP	10	$500.00		$5,000.00
Totals			**$300,000.00**	**$1,400,000.00**

Approvals – Sign Off

The following signatories approve this project to proceed to planning, as defined in this document.

Name/Position	Signature	Date
Greg Bass: Sponsor		
Murray Besenski: Associate Superintendent		
David Peat: Associate Superintendent		
Kevin Wttewaall: Project Manager		

ENDNOTES

[i] Alberta Education; "One-to-One Mobile Computing: Literature Review;" (August 2006); http://education.alberta.ca/media/528965/litreview.pdf; Retrieved Oct 2009

[ii] Reports that have summarized the lessons that educators have learned regarding their implementation of one-to-one mobile computing include the following:

1. Alberta Education; "One-to-One Mobile Computing: Literature Review;" (August 2006); http://education.alberta.ca/media/528965/litreview.pdf; Retrieved Oct 2009
2. Livingston, Pamela; 1-to1 Learning: Laptop Programs That Work; International Society for Technology in Education, Washington, DC; (2nd Edition, 2009)
3. Moore, Darcie (adapted from Tech&Learning); "9-Point Checklist for 1:1;" (Publication date unknown); http://www.guide2digitallearning.com/professional_development/9_point_checklist_1_1; Retrieved Oct 2009
4. Northeast and the Islands Regional Technology in Education Consortium; "Lessons Learned About Providing Laptops for Students;" (2004); http://www.neirtec.org/laptop/LaptopLessonsRprt.pdf; Retrieved Oct 2009
5. Underwritten by Hewlett Packard, Microsoft and Intel; "1:1 Computing: A Guidebook to Help You Make the Right Decisions;" (Nov 2005); http://download.microsoft.com/download/8/d/c/8dc3ebfe-6849-4534-a4b7-846a8c327874/HP1to1Guide.pdf; Retrieved Oct 2009
6. Underwritten by Intel; "Blueprint Solutions for K-12 One-to-One Computing Initiatives: A resource for education leaders and others interested in implementing one-to-one anytime, anywhere computing in K-12 education."; http://www.k12blueprint.com/k12/blueprint/cd/02.PDF; (Updated Jul 2007); Retrieved Oct 2009
7. Underwritten by Intel; "Mobilizing the Millennials: Ubiquitous Computing Enables Anytime, Anywhere, Any Way Learning"; (Updated Jul 2007); http://www.k12blueprint.com/k12/blueprint/blueprint.php; Retrieved Oct 2009
8. Zucker, A; "One-to-One Computing Evaluation Consortium Policy Brief: Starting School Laptop Programs – Lessons Learned;" (Nov 2005); http://ubiqcomputing.org/Lessons_Learned_Brief.pdf; Retrieved Oct 2009

[iii] For more information about the Emerge One-to-One Laptop Learning Project, see http://education.alberta.ca/admin/technology/emerge-one-to-one.aspx.

[iv] See the Emerge Project web site at http://education.alberta.ca/admin/technology/emerge-one-to-one.aspx for more information.

[v] Digital citizenship refers to the appropriate uses of technology.

[vi] These goals are similar to those reported in "1:1 Computing: A Guidebook to Help You Make the Right Decisions" (2005). The authors found the following goals common to one-to-one mobile computing programs:

- To improve equity of access to technology.
- To improve the quality of learning.
- To institute and support best practice in technology integration.
- To improve student learning of content.
- To institute formative assessments and differentiated instruction.
- To increase performance on standardized tests.
- To improve students' ability to become lifelong learners.
- To prepare students for the world of work.
- To improve the home-school connection.

[vii] See the International Society for Technology in Education (ISTE) "Essential Conditions for Implementing the National Education Technology Standards" at http://www.iste.org/Content/NavigationMenu/NETS/ForStudents/2007Standards/Conditions/NETS_for_Students_Essential_Conditions.htm (Retrieved Oct 2009).

[viii] Livingston, Pamela; 1-to1 Learning: Laptop Programs That Work; International Society for Technology in Education, Washington, DC; (2nd Edition, 2009)

[ix] *Underwritten by Intel; "Mobilizing the Millennials: Ubiquitous Computing Enables Anytime, Anywhere, Any Way Learning"; (Updated Jul 2007); http://www.k12blueprint.com/k12/blueprint/blueprint.php; Retrieved Oct 2009*

[x] *Northeast and the Islands Regional Technology in Education Consortium; "Lessons Learned About Providing Laptops for Students;" (2004); http://www.neirtec.org/laptop/LaptopLessonsRprt.pdf; Retrieved Oct 2009*

[xi] *International Society for Technology in Education (ISTE) "Essential Conditions for Implementing the National Education Technology Standards" at http://www.iste.org/Content/NavigationMenu/NETS/ForStudents/2007Standards/Conditions/NETS_for_Students_Essential_Conditions.htm; Retrieved Oct 2009*